

# AMERICAN ARTISAN

JUNE  
1940



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RESIDENTIAL AIR CONDITIONING  
WARM AIR HEATING • SHEET METAL CONTRACTING

ESTABLISHED  
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# LAMNECK Series 700 System PREFABRICATED DUCT AND FITTINGS

## Eliminates Unit FAILURES!

● 99 times out of a hundred, unit failures can be traced to faulty ductwork. Either the ductwork is improperly sized . . . or the job can't be balanced . . . or any one of a number of conditions are present which means that the unit does not deliver the required heat and you end up with a headache and no profit!

But with LAMNECK Prefabricated Ductwork, you avoid all this. Its PRE-DETERMINED ENGINEERING assures correct design—proper size—a system that can be perfectly balanced. And last but not least, it saves Material Cost and Labor Cost, averaging from 25% to 50%. Because you get every penny of this added profit, lies the reason for the growing popularity of LAMNECK Series 700 System Ductwork.

*Specify*  
**LAMNECK**

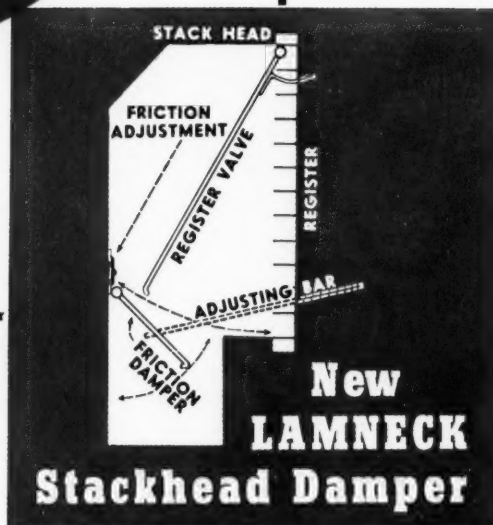
*Write for Name of  
Your Nearest Distributor*



**Prefabricated Duct and Fittings for All  
Types of Residential Warm Air Heating  
and Air Conditioning Systems**

**LAMNECK PRODUCTS, Inc.**

416-436 Dublin Ave., Columbus, Ohio

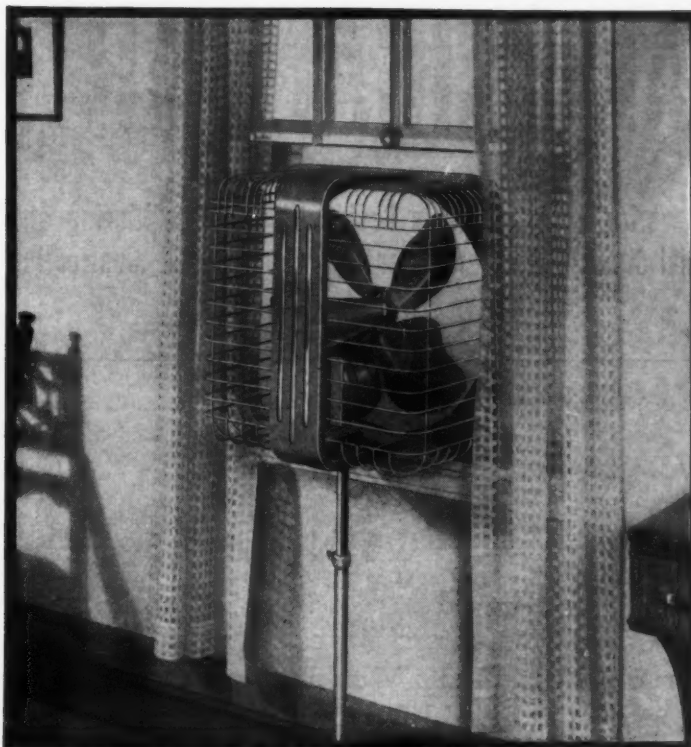


By comparison with your present stackhead, you'll find that LAMNECK Prefabricated Stackhead and Damper saves time, labor and money. It makes possible a one-man job of "balancing." You can regulate the damper with the small adjusting hook illustrated, and at the same time you can check the results of your adjustment. It's adjustable without removing the register, and once set it stays put because of its positive friction lock. It's tamper-proof, too. Guards against construction dirt because it acts as a shield during plastering and finishing. Due to its unique construction, it does not become distorted, bent or "frozen" after installation.

*When air is returned through stud spaces, it can be easily controlled by the use of a Lamneck Stackhead with balancing damper. Write today for complete facts and details.*



*Go After  
Profits from Air!*



## WITH **VIKING** PORTABLE WINDOW FANS

★ Here is summer comfort cooling that people (1) understand, (2) want and, (3) can afford to buy.

It is EASY to sell because (1) it is easy to demonstrate (and does it sell itself!) and (2) we provide a merchandising program to help you get the demonstration.

It is NICE to sell because (1) there is no installation problem and (2) no service problem. When you get your profit YOU KNOW YOU CAN KEEP IT.

These fans are effective. After the sun goes down the air temperature drops from 10 to 15 degrees. The fan pulls out the hot stagnant air which is held in the house and replaces it with cool invigorating air from outdoors.

The dog-days of July and August are just around the corner. A letter to us today will give both you and us ample time to organize your hot weather profit-drive. Why not write us right now?



**VIKING AIR CONDITIONING CORP.**

**9490 RICHMOND AVENUE CLEVELAND, OHIO**

**FANS • BLOWERS • HUMIDIFIERS**

# **VIKING AIR CONDITIONING CORPORATION**

# AMERICAN ARTISAN

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

WITH WHICH ARE MERGED

FURNACES  
SHEET METALS

AND

Warm-Air  
Heating

J. D. Wilder, Editor

A. A. Kennedy, Assistant Editor

Vol. 109, No. 6

June, 1940

Founded 1880

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## In This Issue

THE editors are willing to bet a pretty penny that most readers never dreamed of the extent to which the Federal agencies are going to stimulate buying among farmers and hamlet residents. We never heard of the "High Line Co-operative," to say nothing of the "Traveling Show" of REA. And we are willing to admit that the number of "alphabet" agencies involved in this farmer stimulation scheme surpasses our wildest imagination.

Every reader—manufacturer, jobber, contractor—should be acquainted with this tremendous program as described vividly by Arnold Kruckman in his Washington Letter on page 34.

As announced, a bookkeeping system designed especially for 1940 business requirements begins in this issue (Page 73). The author, Jos. G. Dingle, needs little introduction as he has been a consistent contributor to American Artisan since 1930. The series will set up a complete bookkeeping system with all the necessary forms, sheets, ledgers, time, material, labor cards. The system will satisfy the most "red-taped" investigator but, will be simple enough for any high school bookkeeper.

There are two interesting attic fan articles in this issue. The work of Krauss Engineering in New Jersey (page 37) with commercial cooling is filled with ideas; while the idea of returning exhaust air from the fan to one-half the house (thus using a fan of half ordinary capacity) as advocated by Higgins from Florida (page 50) sounds downright prophetic.

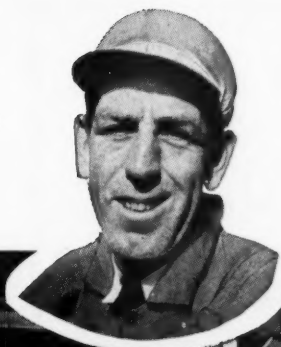
On page 62 we begin the first of several articles by Carter S. Cole in which the fallacies of condemning copper as a roofing material when it is the application methods which are at fault will be discussed in detail.

Member of Audit Bureau of Circulations — Member Associated Business Papers, Inc.

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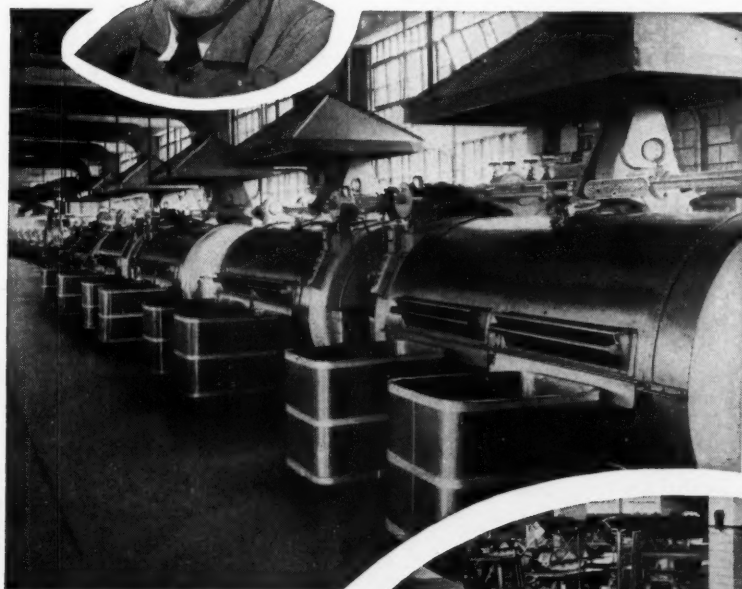
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**More than 8,000 copies of this issue are being distributed**



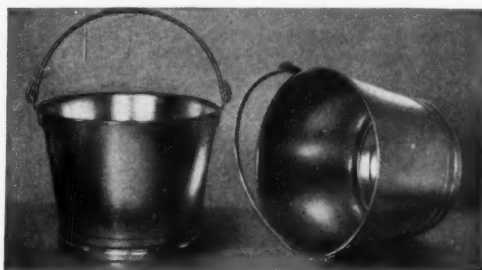
# Look before you Creep!

By TIM SHEARS



1. This first one'll tip you off on how to make the money. Most laundries use washers like these...made of Monel. They find that Monel washers keep clean and smooth inside, so are easy on clothes. Also, they save a pile of dough on power, water, soap an' etcetera. So here's what you do:

2. When you call on the laundries remember they need trucks like you see in the first picture, an' also table tops like these. All right, what are you going to make 'em out of? Same as the washers, of course... Monel. After all, a laundry owner don't spend thousands of dollars on Monel washers, then take chances with trucks that get rusty an' tables that splinter!



4. Turning out Monel buckets is a paying proposition for two reasons: First, because they're simple to make. Second, because the laundries like these Monel buckets. They're easy to keep clean, can't rust, won't leak, and are good for a lifetime of hard service.



3. A steamy laundry's no place for metal that gets rusty. Imagine what would happen to clothes sliding down a rusty, worn-out chute! So jobs like this are a cinch for Monel... an' you'll have no trouble getting the orders.

If there's anything you want to know about making any of these jobs, just drop me a line. An' keep your eyes open for this kind of business. The laundries are full of it... an' laundry owners want Monel.

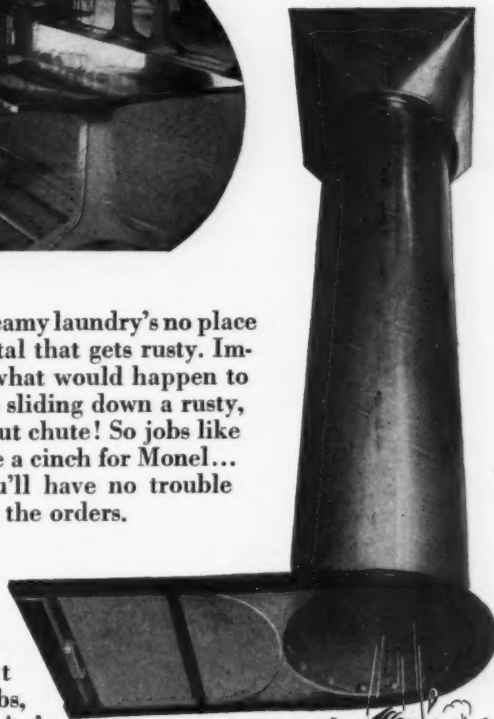
TIM SHEARS

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York, N. Y.

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

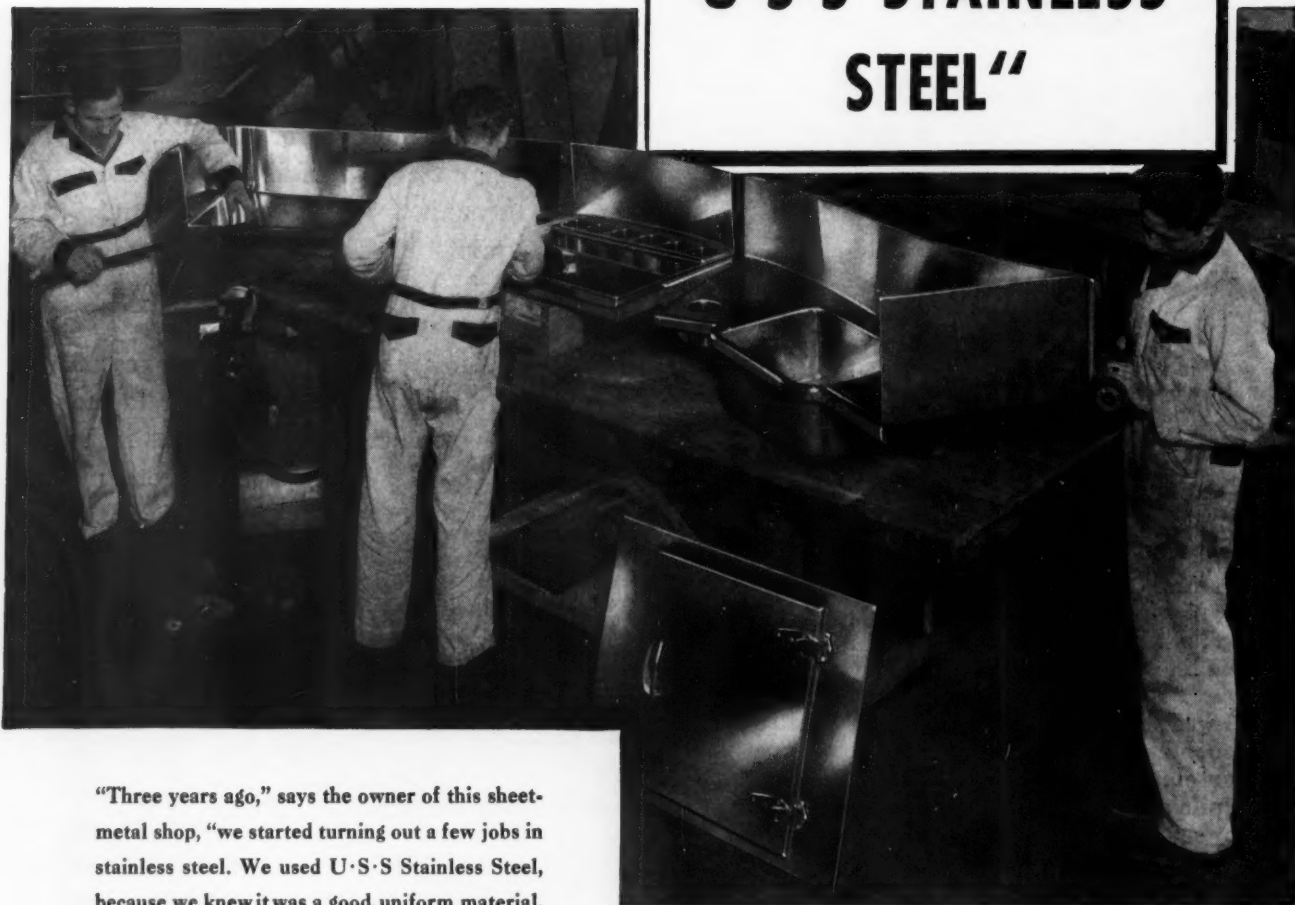
P. S. When you call on the laundries, look out for strange doors... they might lead to chutes!





*"Started as  
a Sideline . . .*

**NOW DO 90%  
OF OUR WORK IN  
U·S·S STAINLESS  
STEEL"**



"Three years ago," says the owner of this sheet-metal shop, "we started turning out a few jobs in stainless steel. We used U·S·S Stainless Steel, because we knew it was a good, uniform material, and because the U·S·S specialists were so helpful to us in designing, welding, and finishing.

"I never saw anything catch on so fast. It seems that every stainless job we installed brought us two more orders. Now we do at least 90 per cent of our work in U·S·S Stainless Steel. We're known throughout this territory now as Stainless Specialists. Whenever anybody wants work done in stainless steel, they immediately think of us."

**T**HAT'S the way it has worked out in dozens of sheet-metal shops. They start working in U·S·S Stainless Steel as a sideline, and before they know it, they are specialists in their territory, with more business than they know how to handle.

If you haven't already begun handling stainless sheet work, it will pay you to start now. The opportunities are endless—hotels, restaurants, clubs, stores, hospitals, factories, schools, and private homes—all have places where this bright, easy-to-clean metal is needed. Ask the U·S·S specialist to give you any help you need, or write for data.

## U·S·S STAINLESS STEEL

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*

CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*

NATIONAL TUBE COMPANY, *Pittsburgh*

Columbia Steel Company, *San Francisco, Pacific Coast Distributors*

United States Steel Export Company, *New York*

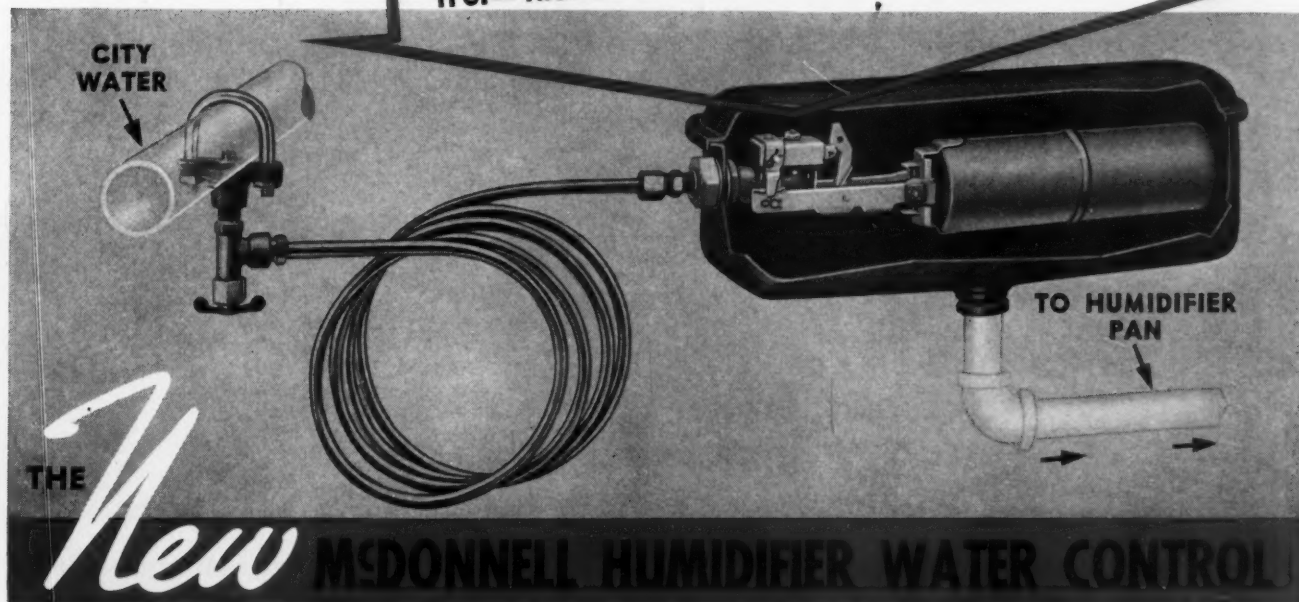
Scully Steel Products Company, *Chicago, Warehouse Distributors*



**UNITED STATES STEEL**

# SNAP ACTION

That's what you need in a humidifier water control—that's what this advanced design gives—



**A** HUMIDIFIER water control that just barely cracks open and seeps or dribbles when the float drops, can't stay on the job very long under the conditions of heat, mud and foreign matter that such a valve encounters.

But why tell you this? You have probably seen plenty of proof of it—valves stuck open, flooding the pan or basement floor—valves plugged up with lime or dirt, killing the whole humidifying effect.

The new McDonnell Humidifier Water Control, pictured above, gets away from this fault of former controls. Its foremost feature is an ingenious cam-and-roller valve action that makes the

valve snap from tight closed to wide open in a quarter of an inch of water level movement.

There is no seeping or dribbling whatever. The valve opens wide when water is needed, flushing out the orifice and everything on it. It closes with the same snap—absolutely tight against water pressures up to 150 pounds.

That's the basic feature, but it's only one of many. All important parts are located above the water level—valve cone and seat are practically indestructible—float height, and therefore water level, are readily adjusted. But despite its higher quality, this new control is attractively priced.

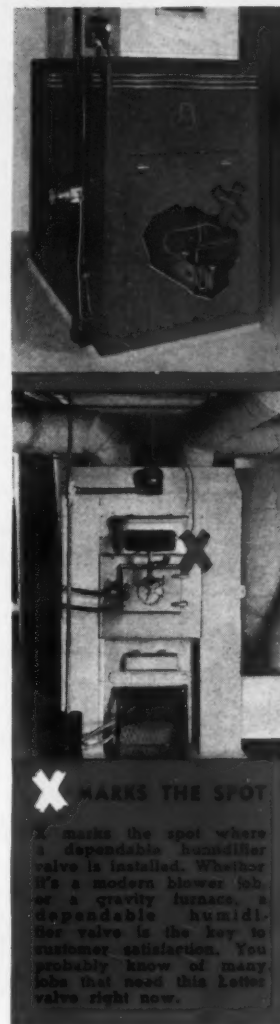
**WRITE for new circular** It shows types for every requirement—describes proving tests—explains how we have built a finer control at a moderate price.

**MCDONNELL & MILLER, 1318 WRIGLEY BLDG., CHICAGO, ILL.**

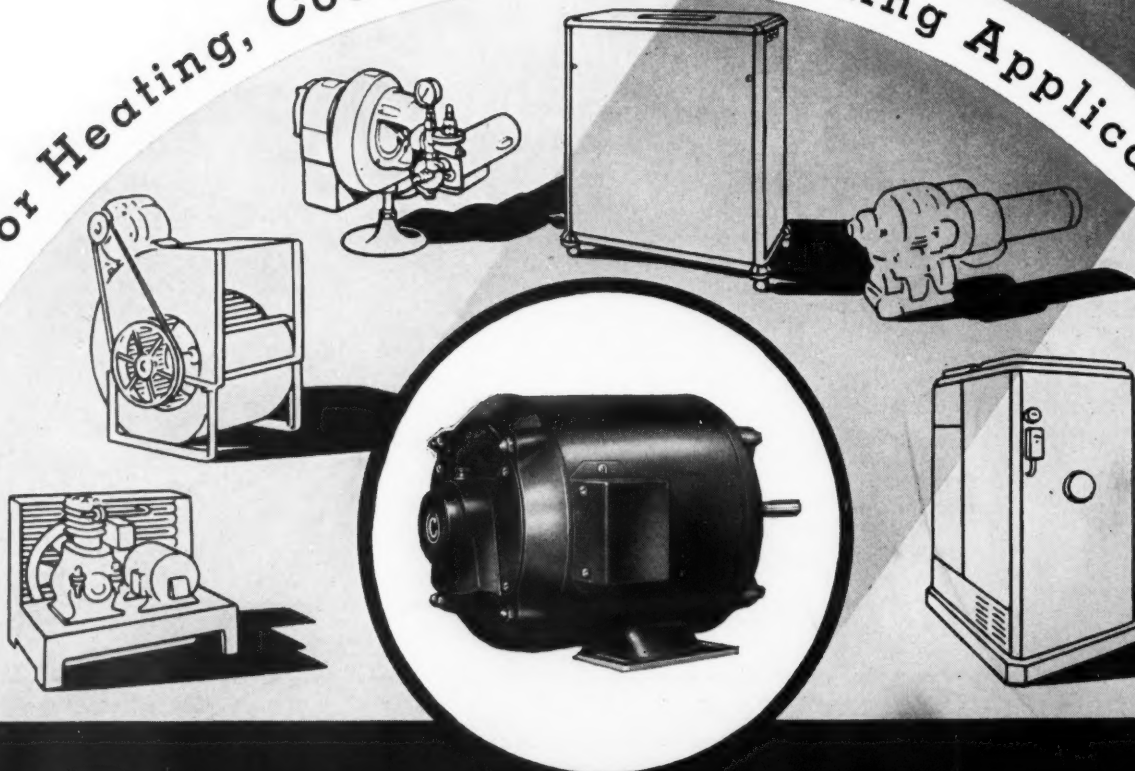
*"Doing One  Thing Well"*

# MCDONNELL

**HUMIDIFIER WATER CONTROLS  
BOILER WATER FEEDERS  
LOW WATER CUT-OFFS**



For Heating, Cooling and Ventilating Applications



*Century*

## Repulsion Start Motors

Assure

**High Starting Torque  
Low Starting Current  
Least Light Flicker**

● Smooth starting, with least voltage drop and least light flicker, are important performance requirements for the user of any air conditioning equipment.

The high starting torque and low starting current of Century Repulsion Start Induction Motors result in just these operating characteristics. In addition, Century Motors' unusual freedom from vibration assures exceptional quietness in both starting and running.

It takes a motor that fits the job to assure completely satisfactory performance. And Century Type RS Motors are ideally engineered to match the load requirements of such equipment as blowers, fans, stokers, oil burners, air conditioning

and refrigeration compressors—and provide the most economical, dependable performance. Attractive exterior motor appearance matches modern equipment design.

Your customers will be satisfied when your installations are Century equipped and you'll be sure to have a motor that accurately fits the job. Find out more about the advantages of Century Motors for any air conditioning and refrigeration application. The experienced counsel of your nearest Century Motor Specialist is always at your service. Call him in.

### CENTURY ELECTRIC COMPANY

1806 Pine Street, St. Louis, Missouri  
Offices and Stock Points in Principal Cities.



One of the Largest Exclusive Motor Manufacturers in the World





# 3

# Big Reasons *why*

# MOR-MAC

## HEATING AND AIR CONDITIONING UNITS

*are a great line to handle!*

- **HIGHEST EFFICIENCY . .**
- **MINIMUM SERVICING . .**
- **LIBERAL OPERATING MARGIN .**

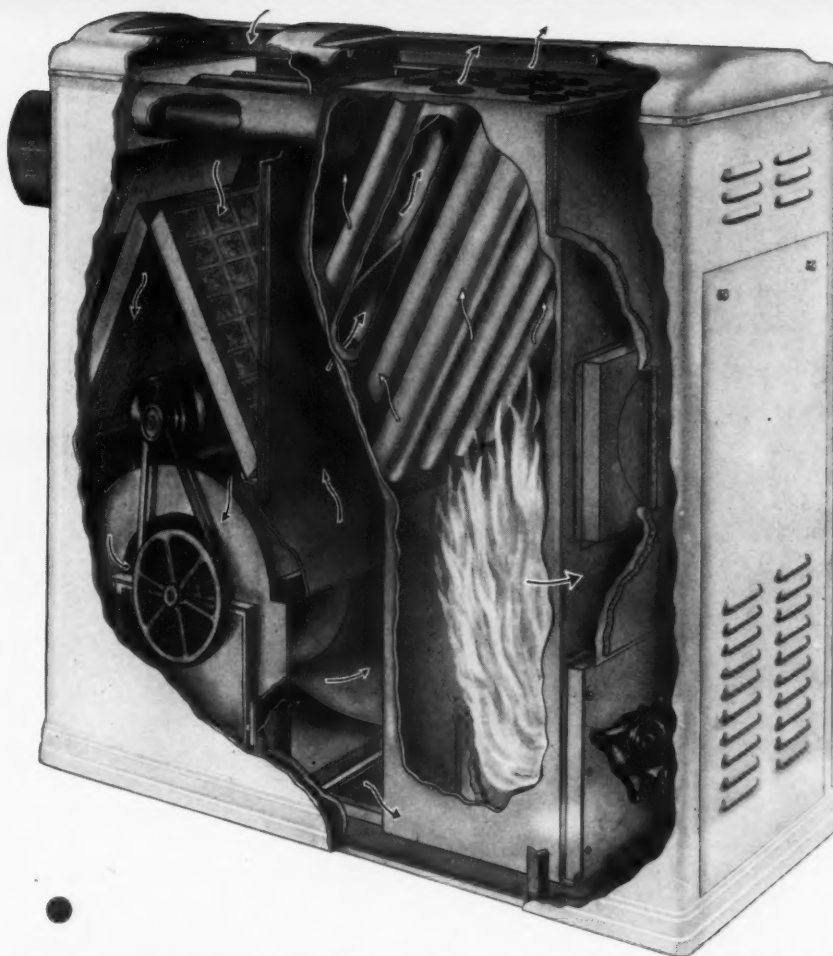
Heating engineers have pronounced the Mor-Mac Unit a definite advancement in economical domestic winter air conditioning.

The Mor-Mac Unit has proved in actual operation to be one of the most efficient heating units on the market. With over 80% direct heating surface and utilizing an entirely new heating principle, it delivers an abundance of heat with surprisingly low fuel consumption. So efficient is the Mor-Mac Unit that, when the gases of combustion are finally released to the stack, only enough heat remains in them to insure proper chimney draft and prevent condensation.

The Units are especially easy to install. There are no hand-made parts. All sheet metal parts are made from complete tools and dies and are assembled in elaborate fixtures. Interchangeability and accuracy are guaranteed. Corners are rounded. All nuts are permanently welded in place.

Mor-Mac Units are superior in quality yet are priced to meet competition and offer a liberal operating margin to the jobber. Ample production facilities are your assurance of a quality product and prompt deliveries.

Your territory may still be open. If so, it will pay you to get complete information on a Mor-Mac Contract. It's liberal. It will help you to increase your profits this year. **WRITE TODAY!**



This cut-away section shows the longer air travel from the cold air intake to the warm air outlet in the Mor-Mac Unit. Note particularly the Turbulators in the heating tubes. These increase the air travel in the heat tubes and effect a thorough mixing of the air, insuring a uniform high temperature at the warm air outlet.

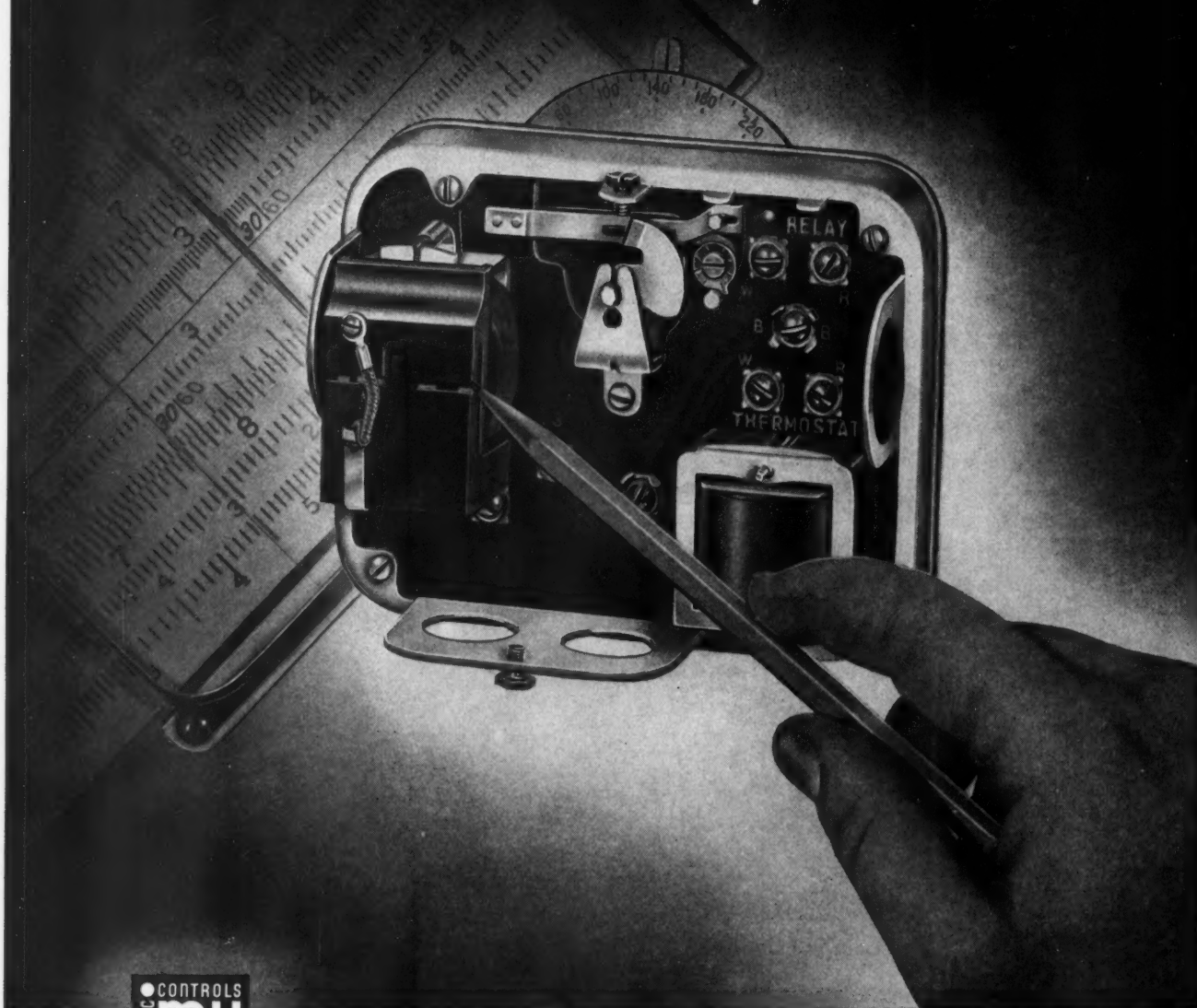
*All the accessories are made by reputable, dependable manufacturers.*

# MORRISON STEEL PRODUCTS, INC.

601 AMHERST STREET

BUFFALO, NEW YORK

# VALUE *Can't Always be Seen*



*The new L147 Summer-Winter Controller combines, in one instrument, a low limit control and relay for water circulator. The compact relay unit, indicated above, makes this new instrument a masterpiece of engineering design.*

*I*nto every Minneapolis-Honeywell product is built the results of more than 50 years of control experience and thousands of laboratory and field tests. This engineering, design and precision manufacturing represents value that cannot be seen, but it insures the accuracy and dependability of every Minneapolis-Honeywell control. It will back up your promise of care-free, uninterrupted operation and is good insurance on every job.

## MINNEAPOLIS-HONEYWELL

Minneapolis-Honeywell Regulator Company, 2726 Fourth Ave. S., Minneapolis, Minn. Canadian Plant: Toronto, Ontario. European Plant: London, England. Company owned branches in 49 other cities.

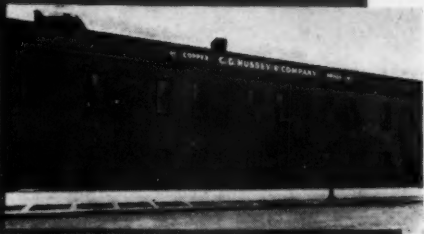
*Control Systems*

FOR IMMEDIATE DELIVERIES OF COPPER OR BRASS

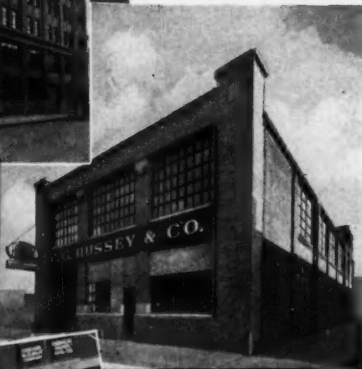
# Check YOUR LOCAL HUSSEY WAREHOUSE

Seven strategically located Hussey Warehouses with full stocks of copper and brass in every form are your guarantee of a quick, dependable source of supply the year around. Hussey Warehouse Service enables you to change deliveries from days into hours... reduces inventories to the minimum. Your local warehouse is always as near as your telephone.

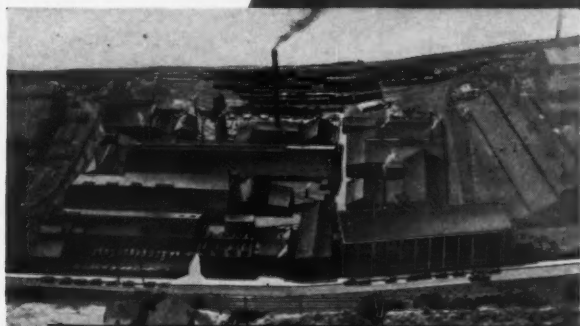
**C. G. HUSSEY & CO.**  
(Division of Copper Range Co.)  
Rolling Mills and General Offices:  
Pittsburgh, Pa.



Chicago Warehouse  
24 Commercial Square  
Telephone MIAMI 2233  
  
Cleveland Warehouse  
5318 St. Clair St.  
Telephone WEnderson 7885  
  
Chicago Warehouse  
812 S. Jefferson St.  
Telephone BRIdgeway 5687



Philadelphia Warehouse  
1832 Fairmount Ave.  
Telephone FREmont 5237



Pittsburgh Warehouse and Rolling Mills  
2850 Second Avenue  
Telephone GRant 3050

*Copper*

**HUSSEY**

*Brass*



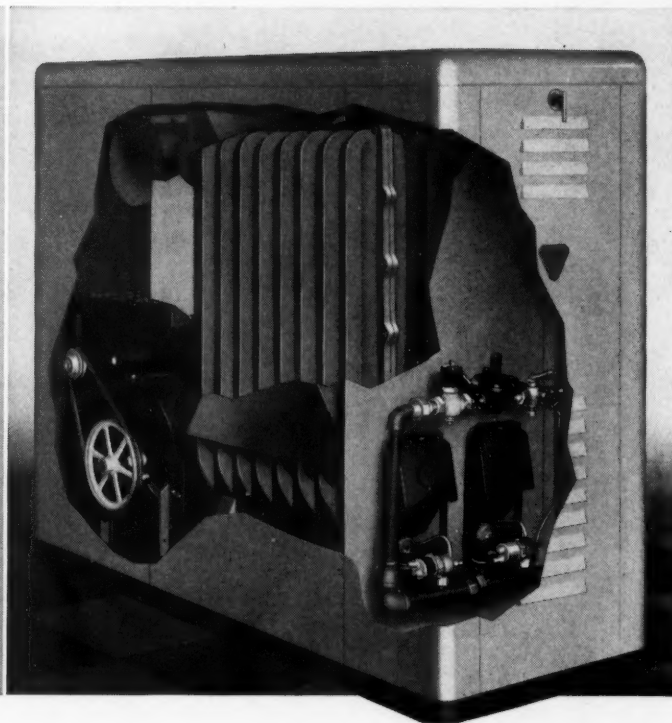
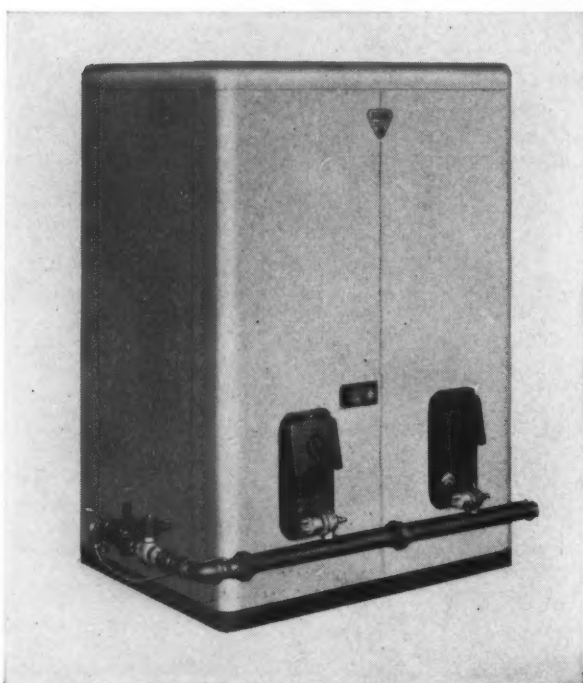
# RYBOLT

## CAST IRON GAS-FIRED

### Winter Air Conditioner

*Entirely New  
in Design*

● Here's a RYBOLT Winter Air Conditioner which sets up a new standard of efficiency, economy and convenience in gas heating. Completely new in design, this Cast Iron Gas-fired unit embodies special advanced features of unusual importance. Among them are included a new type combustion chamber and novel flue economizer, both made of durable gray iron



castings, which minimize the effect of harmful condensation of moisture in the flue gas. The chamber is of special design which directs the generated heat upward through a series of scientifically baffled passages, where it is continuously wiped against the inner surfaces, providing quick radiation of heat. Projecting into the return air chamber, the flue economizer serves as a preheater, thus promoting fuel economy. Because of its large volume of iron the heating element holds heat a long time, thus keeping temperatures equalized. Compact in size the RYBOLT Gas-fired Winter Air Conditioner may be installed in minimum floor space. Handsomely finished in smooth gray Hammerloid enamel with black base. Equipped complete with specially designed burner, top mounted motor blower, automatic control and automatic humidifier. Five sizes.

#### CAST IRON GAS-FIRED GRAVITY UNIT

This gravity unit has the same heating element as the forced air unit. Modestly priced, it provides all the advantages of gas firing with its convenience, cleanliness and comfort. Installation cost is small and operating expense low.

WRITE FOR set of folders covering  
the complete Rybolt line of Warm Air  
Furnaces and Winter Air Conditioners.

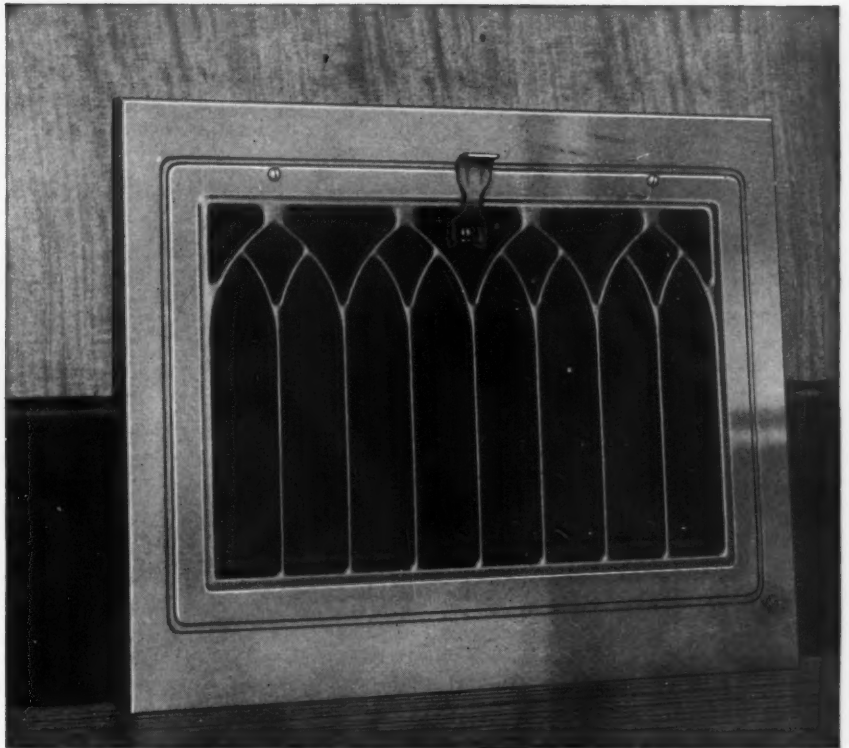


**THE RYBOLT HEATER COMPANY**  
**615 MILLER STREET • ASHLAND, OHIO**

# *Don't Overlook the Importance* **of AIR CAPACITY!**

## **H&C No. 120** **BASEBOARD REGISTER**

*Combines exceptionally large free area with construction that permits secure, tight installations.*



Check the air capacity of the gravity registers you contemplate using. It's important! You'll find some registers are so low in air capacity that it takes a larger size register to equal the capacity of an H&C No. 120 in any given size. That means unnecessary additional cost, or, on the other hand, inadequate capacity and unsatisfactory performance.

The exceptional air capacity and attractiveness of the No. 120 Design have made it by far the most popular in America. Furthermore, the construction of this register permits the stackhead to be lapped over the frame and then securely clamped into position by attaching the face. This results in a permanently tight, leakproof, solid installation and the assurance that the stackhead will never interfere with operation of the valve. No. 120 is a mighty safe Baseboard Register on which to standardize. See it at your H&C Jobbers'.



### **HART & COOLEY MANUFACTURING CO**

**FACTORY AND ENGINEERING SALES OFFICE:**

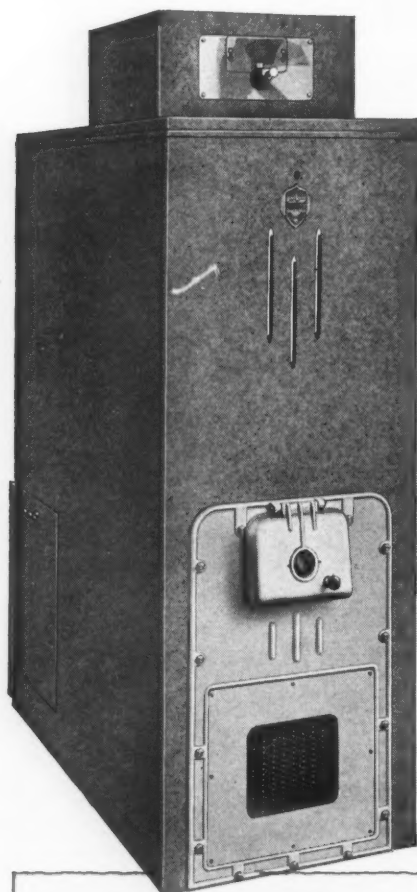
**HOLLAND  MICHIGAN**

Chicago Office: 61 W. Kinzie St. Philadelphia Office: 1600 Arch St.

Warm Air Registers • Air Conditioning Grilles • Damper Regulator Sets • Dampers • Chain • Pulley



MAKE THE SMALL-HOME OWNER HAPPY AND MAKE MONEY AT THE SAME TIME



# Sell the New TORIDHEET SERIES 65 UNIT WITH CAST CHROME-ALLOY FIRE RING\*

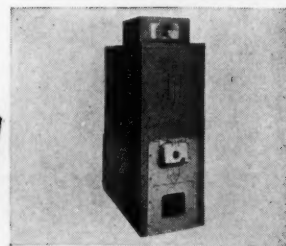
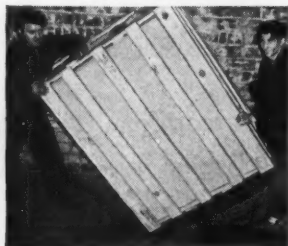
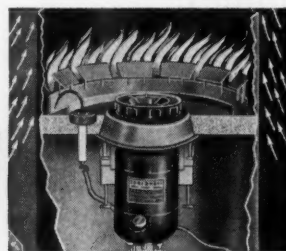
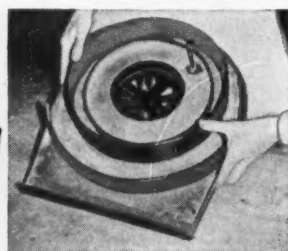
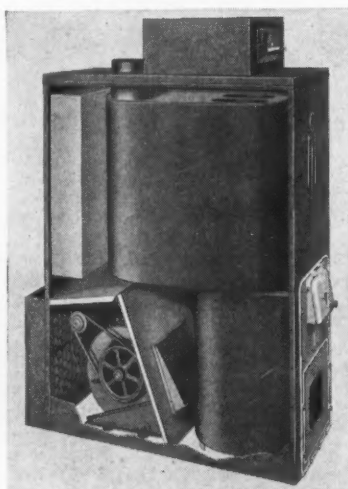
**NEW TORIDHEET UNIT • 65,000 B.T.U.  
AT REGISTERS • REAL "PACKAGE" JOB  
BUILT FOR LOW-COST HOMES**

Make no mistake about it — the new Series 65 oil-fired air conditioner wasn't designed to see how cheap it could be made... it was built to the *Toridheet standard* and then priced to meet the demands of small-home owners and operative builders.

This unit has *everything* contained in larger, higher-priced units — sturdy, electrically-welded steel heating ele-

ment... blower... filter... humidifier... gleaming cabinet in blue lacquer — it's a jewel in appearance and performance. And, best of all, it's powered by the fuel-champion Toridheet wall-flame oil burner.

We haven't enough space to tell you all about the new Series 65 unit. But write, wire or phone for *complete* information. Don't delay — act TODAY.



**1** One-piece cast chrome-alloy fire ring. Used exclusively on all Toridheet units. Built to endure. Out-performs ordinary construction. Obsoletes older methods of oil burning. Saves installation costs — eliminates guesswork.

**2** No installation problem. The Toridheet wall-flame oil burner is built into the heating element at the factory. Burner places the flame *where it belongs* — directly *against* the heating surfaces. Incomparable performance assured at low oil rates.

**3** Complete unit comes to you or direct to the job as a "package." Entire air conditioner is shipped in ONE CRATE. Photo shows how easy it is for two workmen to move the crate down the basement stairs to the permanent location of the unit.

**4** Crate is easily removed. Note that the unit is practically ready for use within a few minutes after delivery. Compare these two easy steps with the complicated and costly procedure necessary with the ordinary unit.

# TORIDHEET

OIL BURNERS • OIL-BURNER BOILERS • AIR CONDITIONING UNITS • WATER HEATERS • FURNACES FOR OIL, COAL AND GAS

CLEVELAND STEEL PRODUCTS CORPORATION, TORIDHEET DIVISION

MADISON AT W. 115 ST.

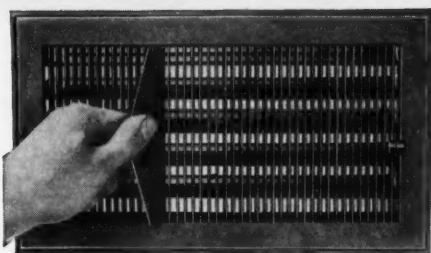
CLEVELAND, OHIO





# Guarantees **PROTECTION TO THE WORLD**

OF  
**AIR-CONDITIONING CONTRACTORS**  
with the **FINEST**  
**Air-Conditioning Register and Grille Styles**



Style 256 U. S. Air-Conditioning Register

## NEW 4-WAY FLOW

STYLE  
256

## **FLEX-BAR**

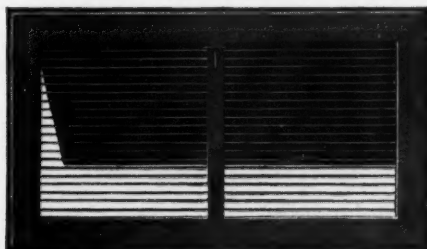
STYLE 256 U. S. Air-Conditioning Registers Deliver Full-Face Coverage with Full 4-Way Directional Flow accomplished by Multiple Valves and Grille Bar Setting. **NEAT**—Not an ordinary punched design!

This new development of the U. S. Air-Conditioning Register Line furnishes complete adjustment of Air-Flow to any degree of Up or Down Flow required by setting of multiple valves with the knob at the right.

Direction of side flow is accomplished by using a handy setting wrench on the Flex-Bars in the Grille to get any Left or Right directional flow required. This Style of Flex-Bar Register is recommended for Air-Flow setting at the time of installation, but may be reset or changed any reasonable number of times.

## **Quality and Low Cost Combined**

### USE STYLE 153 LINE



Style 153 U. S. Air-Conditioning Register

—and save the extra cost. You know how your jobs run—side flow is required on less than 15% of the openings. Why pay the extra for every opening? U. S. Inset Panels will "pinch hit" on the less than 15% of openings where side flow is required. You'll find Style 153 an ideal solution where you want to supply quality registers on a competitive basis—with Inset panels for Left, Right, or Left and Right Flows where necessary—and save the extra cost.



**NATIONAL**  
The original **LEAK-PROOF** perfected product in Gravity Baseboard Registers.



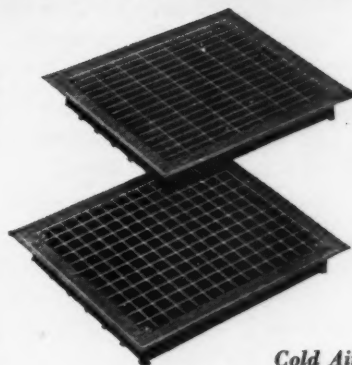
**PANAMA**  
The neatest design in the Vertical-Bar Type Gravity Baseboard Register.

### TRUSSTEEL

The snug fitting U. S. Trussteel Register with heel-proof spacing and natural photographic wood grain finish sets a new high standard of craftsmanship.

### EMBOSSED

The U. S. Steel Embossed Register—"world's strongest"—is favored everywhere for jobs demanding a really serviceable register of smooth appearance and adequate capacities.



*Cold Air  
Faces to Match*



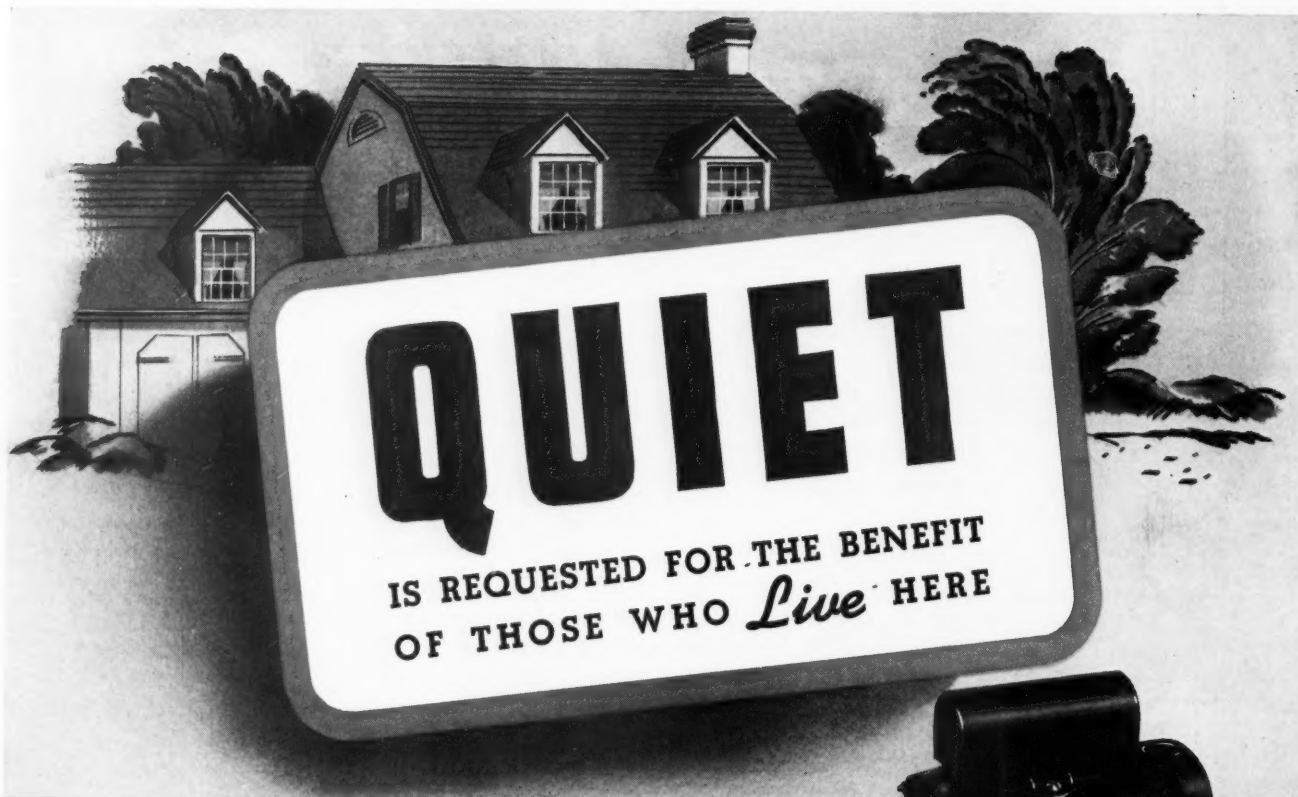
Send for Summer Price Schedules

# **UNITED STATES REGISTER CO.**

**BATTLE CREEK, MICHIGAN**

MINNEAPOLIS • KANSAS CITY • ALBANY • SAN FRANCISCO • NEW YORK, N. Y.

CANADIAN MANUFACTURING DISTRIBUTORS — Canada Register & Grille Co., Ltd., Toronto, Ontario



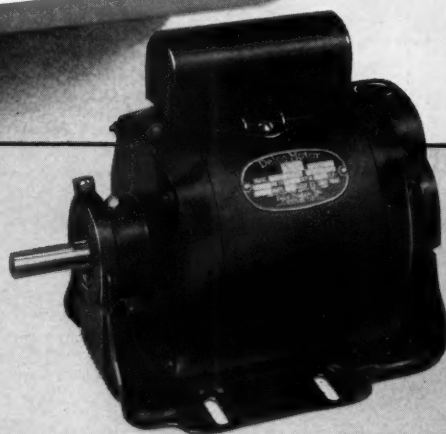
## DELCO MOTORS FOR STOKERS, OIL BURNERS, BLOWERS, COMPRESSORS

To provide the exceptionally quiet operation that is so desirable in heating and air-conditioning installations, every Delco motor is dynamically balanced on a specially-built machine developed through General Motors Research. The resulting freedom from vibration not only protects against noise transmitted through ducts, but also extends the life of the motor.

Other manufacturing operations which contribute to the satisfactory performance of Delco motors include precision machining of bearings, shafts, frame and mountings; all alignments are held to very close limits by advanced manufacturing methods.

Of particular interest today is the Delco two-speed motor for blower applications, by which uncomfortable temperature variations are eliminated in forced air systems.

Delco motors are available in sizes from  $\frac{1}{8}$  to 50 h.p., and in types to meet all heating and refrigerating power requirements. Write Delco Products Engineering Department for further information.



*Precision  
Manufacturing  
Plus...*

**Delco Thermotron** provides complete protection against overload and overheating. Listed by Underwriters.

**Delco Centrifugal Switch** provides exceptionally quiet, positive starting.

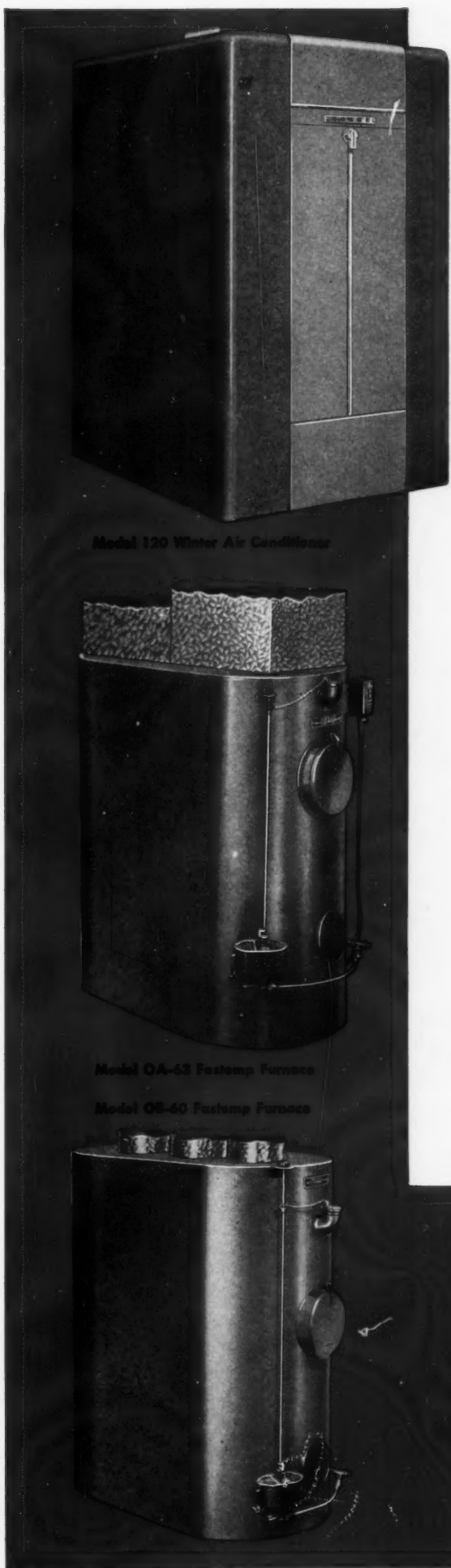
**End-Play Take-up Device** to further reduce vibration — particularly important in V-belt applications.

**Good Appearance** that blends with modern appliance design.

Service for Delco motors is available nationally through United Motors Service.







Model 120 Winter Air Conditioner

Model OA-63 Fastemp Furnace

Model OB-60 Fastemp Furnace

# NORGE puts you OUT IN FRONT

*in Low - Cost Home Heating . . .  
with 4 Package Units That Cover  
90% OF ALL JOBS*

## MODEL 120 WINTER AIR CONDITIONER

Low first cost; pressure atomizing oil burner with full automatic controls; set-up 2 to 3 hours; complete factory wired; mechanical draft; no chimney problems; electric ignition; heat within 50 seconds; 17-ft. long spiral flue for heat transfer; forced air circulation; quiet blower; air filtering; humidity; 120,000 B.T.U. at bonnet; automatic filter by-pass; filter change indicator; single motor; 85%-87% efficiency with oil or gas; basement or utility room installation.

**MODEL OA-63 FASTEMP FURNACE**—63,000 B.T.U. output; ground floor, pit or basement installation; 800 C.F.M. forced air circulation from quiet blower. A modern oil burning unit at less cost than an old-fashioned furnace.

**MODEL OB-60 FASTEMP FURNACE**—60,000 B.T.U. output; gravity circulation; basement or pit installation. An oil-burning central heating plant for the price of a good space heater.

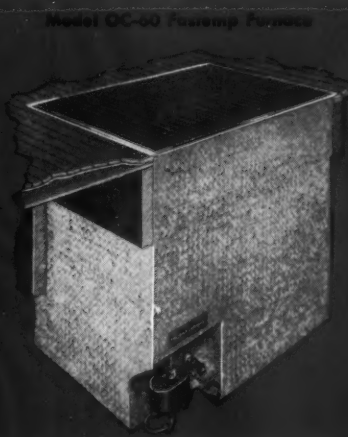
**MODEL OC-60 FASTEMP FURNACE**—60,000 B.T.U. output; floor furnace installation, only 40" deep pit needed below floor.

**FEATURES OF THESE 3 UNITS**—Special Norghe Pot-type oil burner; Down-Draft Whirlator Air Tube to flame; "L"-shaped heat distributor with 40% more heating surface and all-porcelain finish inside and out, acid-resisting, moisture proof, rust-proof; Synchro-Control sets both air and oil.

These four units cover 90% of the entire heating and air conditioning market—and at unbelievably low prices, made possible by Borg-Warner resources and volume production. Wire for full details and literature or mail the coupon.

**NORGE HEATING and CONDITIONING DIVISION  
BORG-WARNER CORPORATION, DETROIT, MICHIGAN**

*Send the Coupon* ➔



Model OC-60 Fastemp Furnace

Date _____	Norge Heating and Conditioning Division Borg-Warner Corporation 670 East Woodbridge St. Detroit, Michigan RUSH me information about your line of heating equipment.		
Name _____	Address _____	City _____	State _____
			AA-113





*Lasting Protection  
Uniform Quality*

# WEIRCOLOY

COPPER BEARING GALVANIZED SHEETS

These outstanding copper bearing sheets are known to the sheet metal trade for their resistance under exposure, genuine all-round satisfaction they

give in service and for their uniform high quality.

Specify WEIRCOLOY the next time you need the best in galvanized copper bearing sheets.

## WEIRTON STEEL COMPANY

## WEIRTON, W. VA.

Boston, 1324 Statler Office Building; Chattanooga, Hamilton Bank Building; Chicago, 2128 Builders Building; Cincinnati, 2606-7 Carew Tower; Cleveland, 1217 Leader Building; Denver, John S. Worthington Co., 511-513 Mercantile Building; Detroit, General Motors Building; Houston, 1901 Franklin Avenue; Indianapolis, Chamber of Commerce Building; Kansas City, Missouri, 231 West Forty-Seventh Street; New York, 405 Lexington Avenue; Philadelphia, Broad Street Station Building; Rochester, Genesee Valley Trust Building; San Francisco, 824 Sharon Building; St. Louis, E. R. Hensel Company, Cotton Belt Building; Montreal, Quebec, A. C. Leslie & Co., Ltd., P. O. Box 1420; Toronto, Ontario, A. MacNish, 357 Bay Street.

division of



NATIONAL STEEL CORPORATION

Design



Com  
Gra  
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Taper  
pitch  
 Easily  
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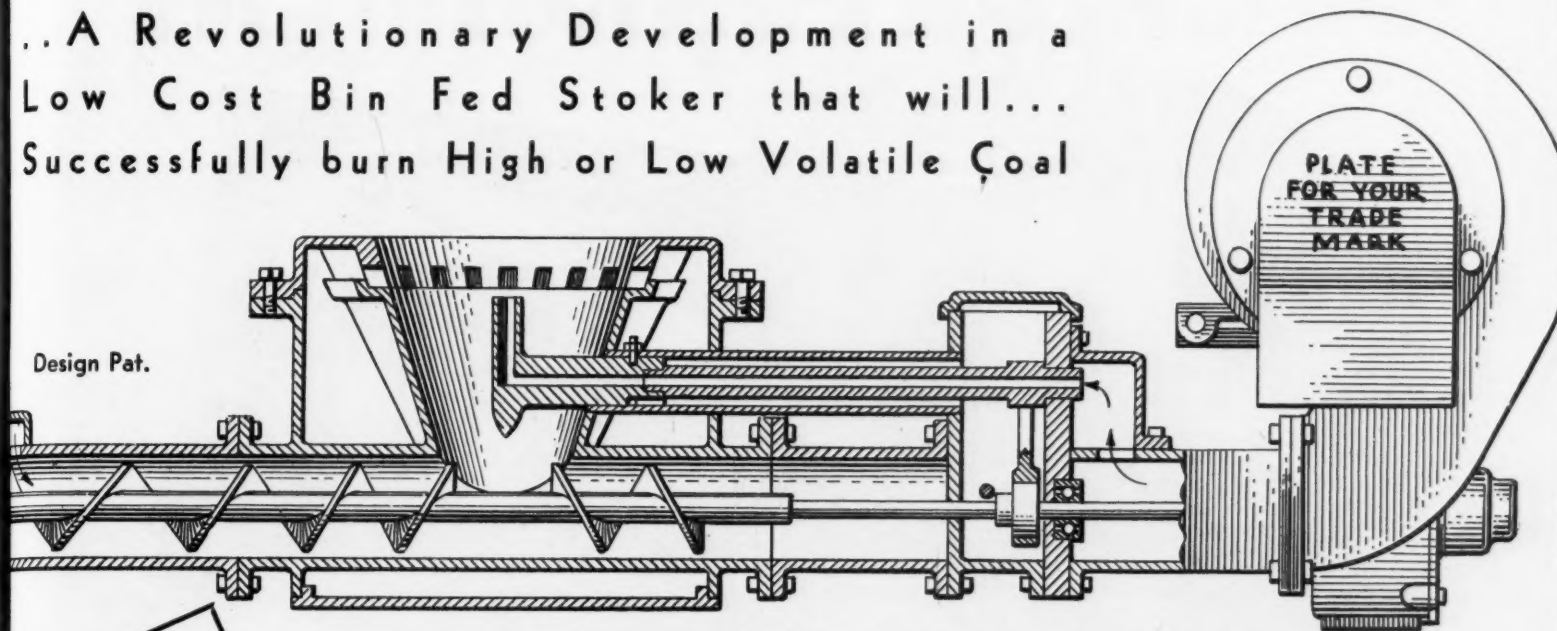
Bin  
pat

F.

18953

# IT'S HERE AT LAST!

.. A Revolutionary Development in a  
Low Cost Bin Fed Stoker that will...  
Successfully burn High or Low Volatile Coal



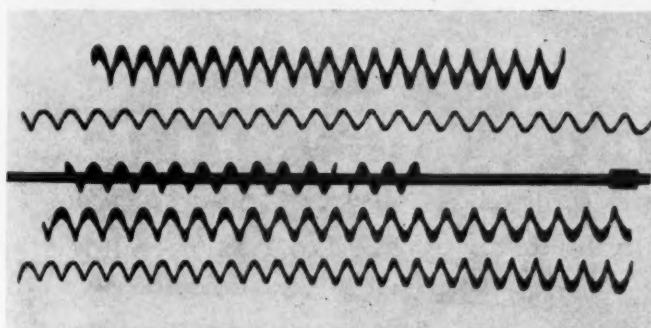
Complete  
Gray Iron  
Castings (Only)  
**\$59<sup>50</sup>**  
F.O.B. Detroit

A successfully proven Air-Cooled oscillating agitator that will burn coking coal. Can be easily removed when burning non - coking coal if desired.

## ATTENTION

**STOKER & FURNACE MANUFACTURERS  
STOKER DISTRIBUTORS & DEALERS  
COAL PRODUCERS & COAL DEALERS**

If you are interested in an extremely low cost proven *Bin-Fed* Stoker that will successfully burn either high or low volatile coking coal and wish to avoid the long delay and high cost of producing one, here is your opportunity to complete your line. We offer our entire *Bin-Fed* stoker castings that you can easily assemble and install with your own name plate on it and sell at a profit.



### BIN-FED STOKER SCREWS

Tapered bin worms made of rust resisting steel alloy with varying pitches to allow for proper flow of coal and still prevent back-smoke. Easily extended and shortened to any length and coupled on the job by means of stainless steel tapered pins. Hard high heat resisting cast steel flights for use in the retort. *Will stand up under the severest heat!*

We will supply a SCREW for a 4" tube at 50c per running foot for use in our stoker. Price includes flights securely electrically welded on shafts.

We are able to twist practically any size worm with any desired pitch and offer the same either with or without shafts.

*A first class continuous drive Transmission with adjustable pulleys. Motors and controls at extremely low prices if desired.*

Bin-fed Stoker Castings and Screws, engineered, patented and manufactured by

# F. D. YARICK

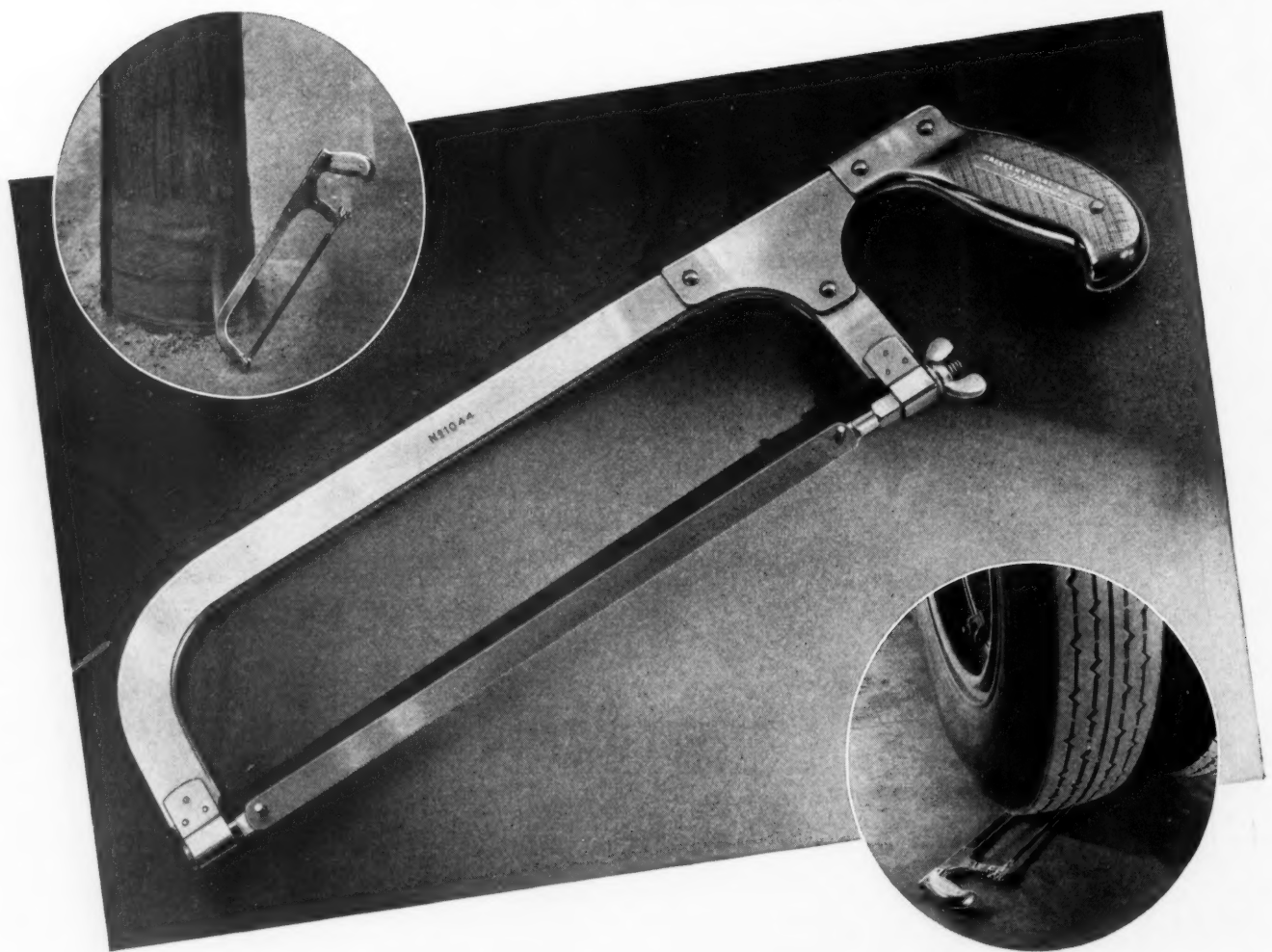
18953 ROSELAWN AVE. - - - DETROIT, MICH.



Our stoker is easily assembled and installed in any furnace. Will feed coal from any angle. Write today for further information.



# BUILT FOR PUNISHMENT



## No. 1044 CRESCENT HACKSAW FRAME

● Here's a Hacksaw that belongs in every good mechanic's kit. It's all steel—even to the handle. Unusually heavy construction fits it for the toughest kind of service. It has rigidity and "backbone" enough to permit the use of 1" power saw blades. Drop it from a scaffold and all you have to worry about is the blade. There are no loose parts to scatter and become lost—frame is so assembled that neither post nor tension screw can fall out even with-

out a blade in place. No. 1044 is solid frame (non-adjustable), and is made in 10 and 12" sizes, finished in handsome nickel plate.

There are other Crescent Hacksaw Frames with wood, steel and composition handles—priced as low as 60 cents. Write for a copy of the new 1940 Crescent catalog showing the full line of Crescent quality tools which are sold by hardware dealers everywhere.

CRESCENT TOOL COMPANY, JAMESTOWN, N. Y.

**CRESCENT** and Smith & Hemenway **TOOLS**



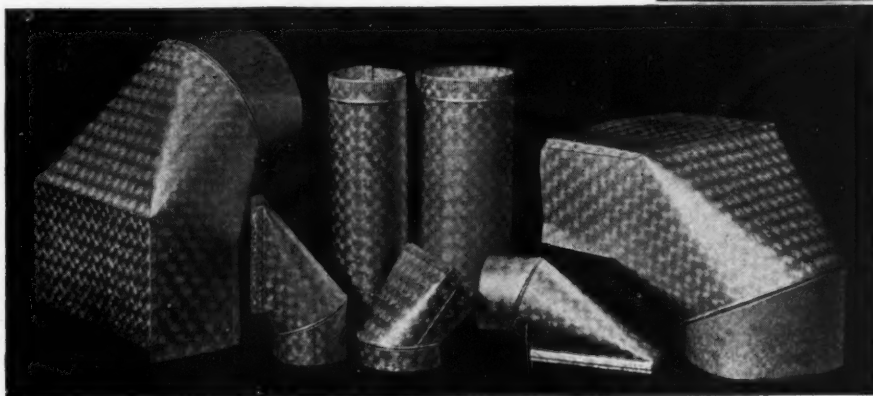
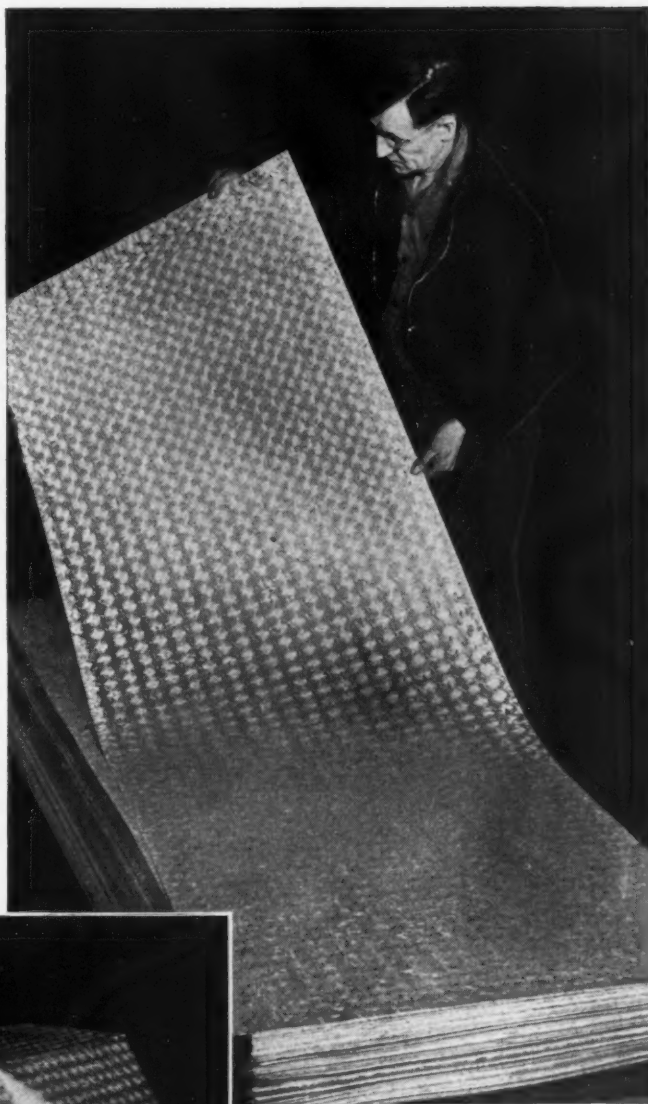
# This Sheet

## WILL PUT YOU ON YOUR METTLE

The old saying—"a man is known by the company he keeps"—applies equally well to the tools and materials he works with. If you doubt this, try to think of one shop doing quality work where just any kind of equipment and metal "get by".

OSBORN'S Golden Star Brand galvanized sheets are helping thousands of plants to do better work because they are better-made to our own rigid specifications. At first glance, you will admire the distinctive appearance of their bright checker-board spangle. Even more, you'll admire how that spangle holds tight when the sheet is double-seamed; how these sheets make-up more easily because they are more uniform in temper, in flatness and in size.

Golden Star Sheets are stocked in a complete range of sizes and gauges at all three OSBORN warehouses. Why not try a few bundles and prove for yourself that these better sheets really help put your entire shop on its mettle?



THE J. M. & L. A.  
**OSBORN Co**  
Manufacturers—Distributors  
BUFFALO • CLEVELAND • DETROIT  
Metals and Metal Products



## Call Scully AND RELAX!

"An order was received at noon Saturday," says our Newark Warehouse, "with request to deliver in Corning, N.Y., not later than Tuesday morning. It was for large C. B. Sections and was immediately shipped by railroad. It was at customer's siding in Corning on Monday morning before the plant opened. The customer was enthusiastic about the way his order was handled."

**Y**OU can rely upon Scully to handle your orders promptly, accurately and cheerfully... whether large or small, regular or rush. So whenever you need steel or steel products, copper or brass, put it up to Scully and know that you'll get prompt action. Thousands of customers have learned that Scully Service is the same at each of our eight conveniently located warehouses. They all

operate on the principle that our customers want immediate service and friendly contacts — and they always hurry whether you ask it or not. And when you say "Rush" they know you mean it.

Why not try Scully Service? Phone, write or wire the warehouse nearest you. And ask for our complete and handy Stock List and Reference Book. It's free.

*We have big stocks on hand NOW... for immediate delivery*

### SCULLY STEEL PRODUCTS COMPANY

*Distributors of Steel, Steel Products, Copper and Brass*

Warehouses at CHICAGO • NEWARK, N. J. • ST. LOUIS • BOSTON  
ST. PAUL-MINNEAPOLIS • CLEVELAND • PITTSBURGH • BALTIMORE

# UNITED STATES STEEL



*The Mark of Service*

ALLOYS  
ANGLES, HOT ROLLED and COLD ROLLED  
ARCHES (CORRUGATED)  
BABBITT  
BANDS and HOOPS  
BARS, HOT ROLLED  
ALLOYS (HR and CF)  
COLD FINISHED  
ELECTRIC HIGH CARBON STEEL  
REINFORCING  
BEAMS and C. B. SECTIONS  
BEEF RAIL  
BOLTS, NUTS, WASHERS, ALL KINDS  
BORING and TURNING BARS and GRINDERS  
BRACES, BOILER  
CHAIN, ALL KINDS  
CHANNELS  
CHISELS  
CHUCKS, STAYBOLT  
CLAMPS, BOILERMAKERS  
CLIPS, PATTERSON  
CLEANERS, FLUE  
CONDUCTOR PIPE  
COPPER and BRASS  
COUPLINGS, NOSE  
CRAYONS, SOAPSTONE  
CUTTERS  
DARDELET RIVET and MACHINE BOLTS  
DRILL RODS  
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EXPANDERS, FLUE  
FERRULES, COPPER  
FLANGES, BOILER and TANK  
FLOOR PLATES  
GALVANIZED SHEETS, BARS, BANDS  
HANDLES, HAMMER  
HEADS, TANK and FLANGE  
HOISTS, HAND and POWER  
IRON, STAYBOLT  
LUGS, BOILER, TANK and SILO  
MACHINERY, HAND and POWER  
MANHEAD PLATES and FITTINGS  
NAILS  
PACKING  
PAINT STICKS  
PLATE STEEL, STANDARD QUALITIES  
ABRASION RESISTING  
COR-TEN and MAN-TEN  
PLUGS, FLUE  
RAILS and FITTINGS  
REAMERS  
SHAFTING  
SHEETS  
ABRASION RESISTING  
ELECTRICAL  
COR-TEN and MAN-TEN  
HOT ROLLED and UNIFORM BLUE  
WELLSVILLE POLISHED  
COLD ROLLED  
STAINLESS STEEL  
GALVANIZED and GALVANEAL  
LONG TERNE  
CORRUGATED  
U-S-S COPPER STEEL  
SPRING STEEL BARS and SHEETS  
STAINLESS STEEL  
STRIP STEEL, CR and HR  
TEES  
TIRE, ROUND EDGE  
TOOLS, HAND and POWER  
for BOILER and IRON WORK  
TROLLEYS  
TUBES, BOILER  
TURNBUCKLES  
VALVES, BLOW-OFF  
WELDING ROD and WELDERS  
ZEES

*The Mark of Quality*



## WAGNER MOTORS - *for Reliable Service*



### A Good Motor is not enough - It must be the **RIGHT** Motor for the job

In selecting the motor for air conditioning equipment it is important that you select the right type of motor—a motor exactly suited for the job. That is why Wagner builds such a wide variety of motors . . . to make it possible to select the **RIGHT** motor regardless of the speed, torque, or current characteristics involved.

#### *Experience*

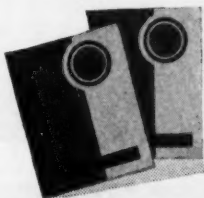
Wagner pioneered in the air conditioning industry. Nearly 50 years of engineering and manufacturing experience is built into every Wagner motor.

#### *User Satisfaction*

The dependability of Wagner motors is an advantage to both the user and the dealer or contractor making the installation. A dependable motor minimizes service calls which sometimes seriously reduce the profit on an installation.

#### *Customer Confidence*

Wagner motors are correctly designed by experienced engineers, carefully constructed of the finest materials by highly skilled workmen, and thoroughly tested at every step in their manufacture. All of which means that Wagner motors give years of satisfactory service which builds confidence and good will for the dealer or contractor who made the installation.



#### *Send for These Bulletins*

Wagner motor bulletins MU-177 and MU-182 contain complete information on design, construction, and performance of Wagner motors used on air conditioning equipment. Send for your copies today. They are free.

**Wagner Electric Corporation**

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

MOTORS • TRANSFORMERS • FANS • BRAKES

In order to properly select a motor to drive any part of the equipment of an air-conditioning plant, the following points should be considered along with the first cost and maintenance.

#### **Load Cycle**

What maximum and minimum horsepower is involved, and what is the probable duration of each?

What are the maximum starting torque requirements?

Is the duty cycle continuous or intermittent, and what method of control and overload protection is contemplated?

#### **Power Supply**

A.C. or D.C., and frequency if A.C.

Voltage.

Phase.

Special starting current limitations, if any, imposed by the power supplier.

#### **Speed Characteristics**

Single constant speed.

Variable or multispeed.

#### **Mechanical Construction**

Is open type motor acceptable, or should Splash proof, Totally-enclosed fan-cooled, or Explosion-proof motor be used?

### MAIL COUPON TODAY

WAGNER ELECTRIC CORPORATION  
6400 Plymouth Avenue  
St. Louis, Missouri

M40-20

Gentlemen:

Please send me FREE bulletins MU177 and MU182.

Name \_\_\_\_\_

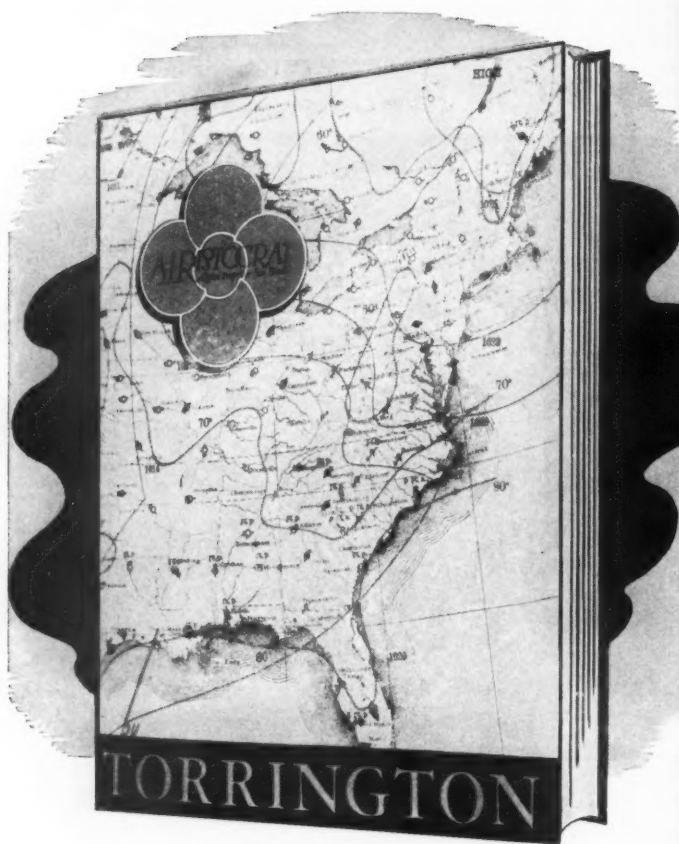
Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_





*Simplifies  
selection of  
propeller  
fan blades*

**TORRINGTON RESEARCH LABORATORIES  
SUPPLY ENGINEERING DATA TO MAKE  
FAN BLADE BUYING ACCURATE AND EASY**



This new catalog of yours is one of the best pieces of technical literature I have ever seen. I find constant use for it in planning and specifying Fan Blades for our refrigeration units.

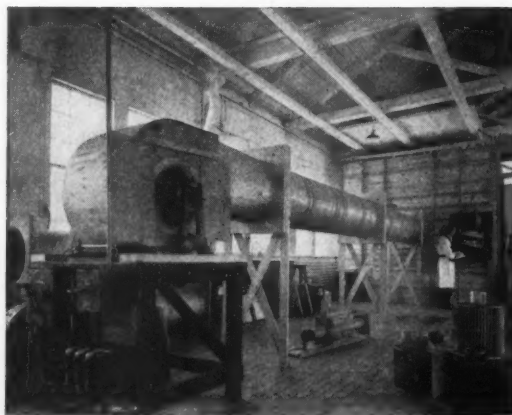
**HARRY C. KROMUS**  
Design Engineer  
Bush Mfg. Co.  
Hartford, Connecticut

This new Torrington Catalog includes between two covers the complete line of Torrington Propeller-Type Fan Blades with full illustrations, detailed specifications and accurate performance characteristics for each blade. It also includes fundamental fan laws and an explanation of the several standard methods for testing propeller fan blades. Design engineers will find this complete and authoritative guide invaluable. Cleverly arranged for rapid reference, the Torrington Fan Blade Catalog contains the answers to all ordinary questions regarding specifications and performance—all guaranteed by experienced Torrington Engineers.

*Write today for this valuable data book — you will find it very useful in planning and specifying Fan Blade requirements.*

A PART OF OUR RESEARCH AND DEVELOPMENT LABORATORY WITH EQUIPMENT FOR PRESSURE TESTING OF LARGE DIAMETER PROPELLER FAN BLADES BY NAFM OR ASHVE CODES

NEMA FREE AIR TEST EQUIPMENT IN CENTER FOREGROUND. SPECIAL ATTIC FAN BLADE TEST BOX IN BACKGROUND AND SMALL NAFM OR ASHVE CODE EQUIPMENT AT THE LEFT.



**THE TORRINGTON MANUFACTURING COMPANY**  
*Torrington-Connecticut*



# Walt Disney did, too!



**Entire new Studio-City enjoys cooling in summer and heating in winter by G-E.** Now Pinocchio, Jiminy Cricket, Mickey Mouse and all the other famous Walt Disney characters are created in cool comfort...in the new Studio-City in the San Fernando Valley near Burbank, California. It's the first such studio-city to be completely air conditioned. *And the Disney Engineers turned to G-E for the right equipment.*



**Complete Control.** In the Animated Building one hundred per cent fresh air is conditioned and circulated. This fresh air supply is divided into two streams—one cooled, the other warmed. In circulation the hot and cold supplies are automatically blended to assure constant volume of air flow and correct room temperature. In this building alone there are 158 thermostatic control points.



**A 1400 ton installation.** In summer outside air is pre-cooled by a 67° natural water supply. (In winter this same supply pre-heats the air). Therefore the operation of blowers, water circulators and refrigeration equipment is effected with but 1300 horsepower. The total cooling effect is over 1400 tons.



**Some special problems.** Cleanliness is particularly important in the Camera Building. A single particle of lint or dust might ruin a "frame." Floors are waxed; operators dressed in lintless material must pause in a "dedusting" chamber before entering.

Heat from the large lights in the Camera Building raises still another problem. Lights for a single camera produce as high as 240,000 Btu of heat each hour. (It would take 40,000 lbs. of ice a day to equalize this heat source.) Special exhaust hoods draw off part of this heat. The balance is easily handled by the Air Conditioning system.

The special needs of the large sound stages accommodating large groups of performers—then again a single performer—are met with full control plus quiet, even distribution of air.

Outside noise from planes using Union Air Terminal was another worry. Careful placing and sound baffling of air intakes, and acoustically treating ducts, walls and ceiling was the answer.



**What this means to you.** The Disney Studio-City installation of G-E Heating and Air Conditioning is but another indication that no matter what your heating or cooling needs, G-E has the right equipment.

And now all General Electric Central Plant Air Conditioning and Industrial

Refrigeration Equipment (5 tons and over) can be purchased directly through your local qualified contractors.

Throwing its full support behind the work of engineers, architects and contractors, G-E has discontinued selling this equipment through customary channels—and has withdrawn all special services which compete with engineers, architects and contractors.

We will gladly furnish information as to capacities, ratings and specifications, and other data needed in applying G-E central plant equipment.



**Here are two new booklets for your file.** Now you can have facts and specifications of all General Electric Unit Room Air Conditioners and of the complete line of G-E Condensing units...at your fingertips. Send for your free copies now.

GENERAL ELECTRIC COMPANY  
Division 199-653, Bloomfield, New Jersey

Gentlemen: Please send me booklets giving facts and specifications on ☐ G-E Unit Air Conditioners; ☐ G-E Condensing Units. ☐ Enter my name on your mailing list to receive booklets covering all your lines.

Name.....

Address.....

City.....State.....

# GENERAL ELECTRIC

# ON THE BRAKE



## Bethlehem Steel Sheets take 180 deg. bends without flaking

Steel sheets get their real test on the brake. That's where you soon find out which sheets take a 180 deg. bend easily, which galvanized coating will stand the severest forming without a sign of flaking.

And that's why we invite you to give Bethlehem Galvanized Steel Sheets a thorough test on your brake. See for yourself how dead soft these Bethlehem sheets are, how easy to bend uniformly and work up easily on the bench. Prove to yourself that the tight zinc coating of Bethlehem Galvanized Steel Sheets

won't flake even in your most difficult operations.

You'll discover, too, that it's profitable to use Bethlehem Galvanized Steel Sheets because they are adapted to every operation in your shop: cutting, seaming, soldering, riveting, and either spot- or arc-welding.

Ask your sheet steel distributor to supply you with Bethlehem Galvanized Sheets. When you have a job where corrosion is a hazard, specify Beth-Cu-Loy Galvanized Steel Sheets that are doubly protected against rust. The extra cost of Beth-Cu-Loy is negligible.

**BETHLEHEM STEEL COMPANY**







*Sell*

# SUNBEAM

## WARM AIR FURNACES AND AIR CONDITIONERS

**T**ODAY small home building is sweeping the country. And you can turn plenty of this profitable business your way with the complete line of Sunbeam Warm Air Furnaces and Air Conditioners for Oil, Gas or Coal—automatic or hand-fired.

For this quality-proved line includes the *right products* at the *right prices* to meet the precise needs of even the smallest homes. And you have the *extra sales advantage* of two famous names—SUNBEAM AND AMERICAN RADIATOR & STANDARD SANITARY CORPORATION!

Start selling small home heating with Sunbeam prod-

ucts now! And remember, on modernization jobs use our **SUMMER FINANCE PLAN:** No down payment—no payments till October 15th—up to 3 years to pay on easy monthly terms—You get cash on installation! Write today for the name of the nearest Sunbeam Jobber.

**AMERICAN** & **Standard**  
**RADIATOR** & **Sanitary**

*New York CORPORATION Pittsburgh*

Visit our building at the  
New York World's Fair.  
Ask for Mr. Frank Stubbs,  
our Exhibit Manager.

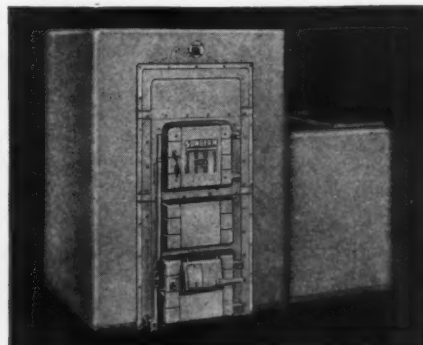
**AMERICAN**  
HEATING EQUIPMENT  
COSTS NO MORE THAN OTHERS



**SUNBEAM SERIES SL AIR CONDITIONER, GAS-FIRED**—A low-cost, efficient unit with steel heating element. 5 sizes with B.T.U. capacities from 70,000 to 150,000 input per hour.



**SUNBEAM SERIES No. 1000 WARM AIR FURNACE**—An inexpensive coal burning cast iron Furnace. Duplex grates, slip-on fronts, and many other outstanding features.

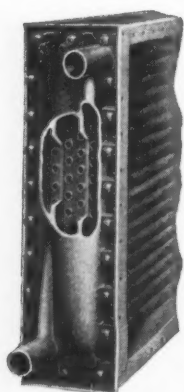


**SUNBEAM SERIES No. 5500 AIR CONDITIONER**—For Oil or Coal—hand-fired or stoker. Combines efficiency, low-cost and fine appearance. Rugged Steel Heating Element that's both riveted and welded. Available in four sizes.

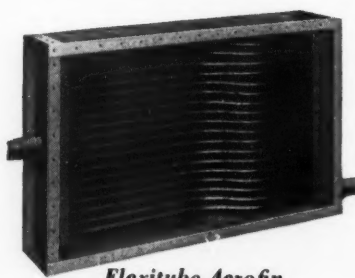
Copyright 1940. American Radiator  
& Standard Sanitary Corporation

# AEROFIN

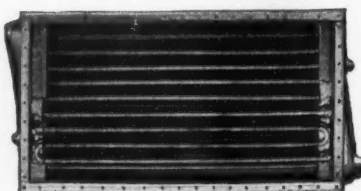
## Heat Exchange Surface



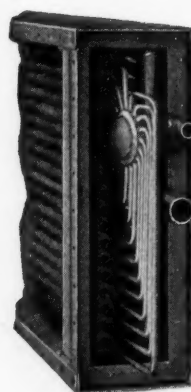
*Cleanable  
Tube Unit with  
Removable Header*



*Flexitube Aerofin*

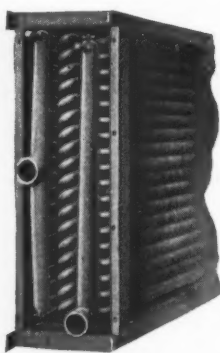


*Universal Aerofin*



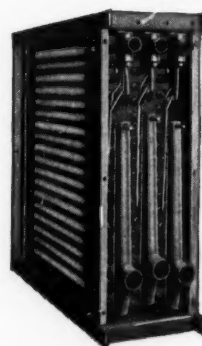
*Direct Expansion  
Unit with  
Centrifugal Header*

### PROVEN PERFORMANCE



*Aerofin Continuous  
Tube Water Coil*

- Aerofin Fan System Heat-Exchange Surface is adaptable to meet all practical requirements of refrigeration.
- Seventeen years of development, research and manufacturing have made Aerofin one of the foremost in the field.
- Aerofin has a complete line for direct expansion refrigerants and water.
- Aerofin Fan System Heat-Exchange Surface is an outstanding engineering achievement.



*Aerofin Direct  
Expansion Unit*

*Send for technical literature or consult any of our district offices  
for the solution of your particular problem.*

## AEROFIN CORPORATION

410 SOUTH GEDDES STREET • SYRACUSE, N. Y.

CHICAGO

DETROIT

NEW YORK

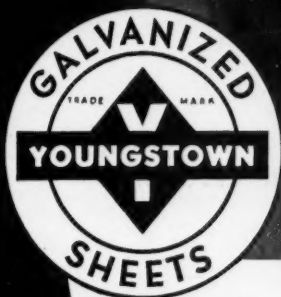
PHILADELPHIA

DALLAS

CLEVELAND



# HOW MANY G.P.M. DO YOUR DUCTS CARRY?



★Conditioned air is moist air, carrying literally gallons of water through the duct work, and "How many gallons per minute?" is a fair question.

Leading heating and ventilating contractors, well aware of this water and corrosion problem, are providing ample protection for their installations and their business reputations by using Youngstown Galvanized Sheets.

A ductile base metal, made especially for galvanizing, is thoroughly cleaned, and galvanized slowly to provide a

generous measure of zinc coating. As a result, Youngstown's Galvanized Sheets not only work well and form easily but also offer a full measure of continuous protection against the ravages of heat, dust, moisture, and corrosion.

For the sake of a job well done and for the development of more repeat business in the future, buy Youngstown Galvanized Sheets.

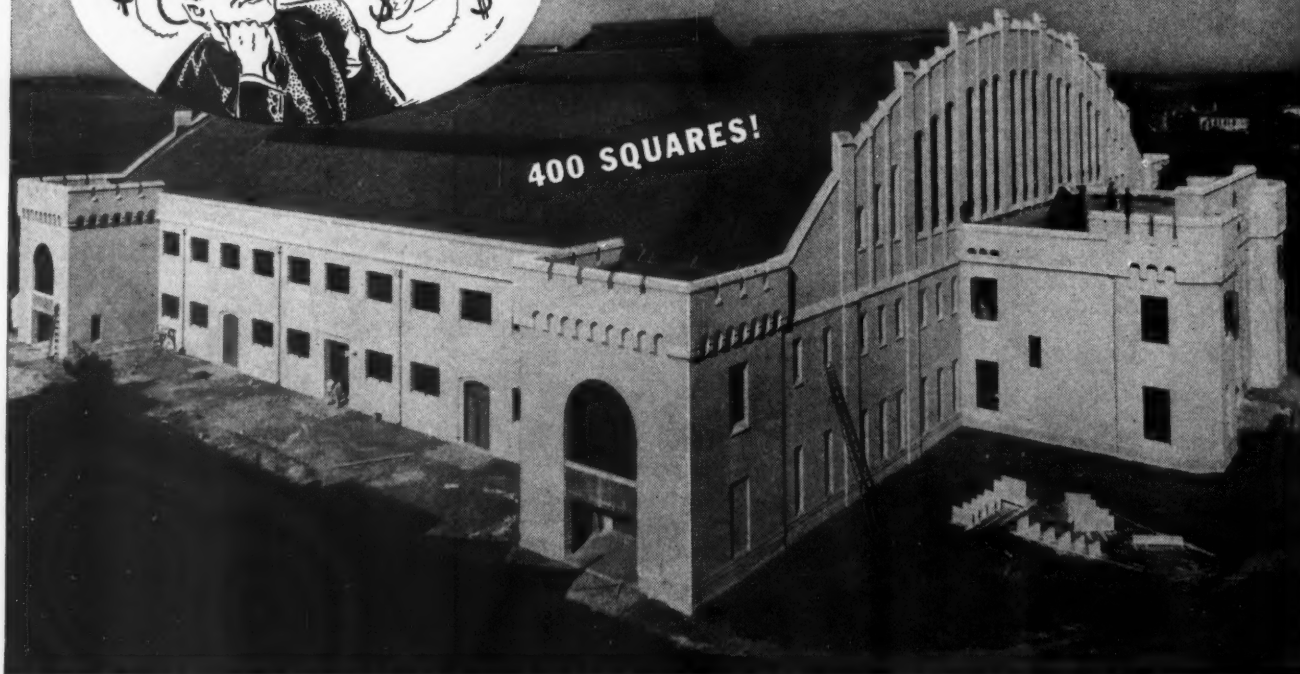
Sheets - Plates - Pipe and Tubular Products -  
Conduit - Tin Plate - Bars - Rods - Wire -  
Nails - Tie Plates and Spikes. 10-10B

**THE  
YOUNGSTOWN**  
**SHEET AND TUBE COMPANY**  
Manufacturers of Carbon and Alloy Steels  
General Offices - YOUNGSTOWN, OHIO



# Copper Roofing

Means Business for  
Sheet Metal Men



New armory of The Citadel, the Military College of South Carolina at Charleston, with roof of 16-oz. Anaconda Copper.  
Ingold Co., Inc., Hickory, N. C., were the sheet metal contractors.

**J**OBs like this one aren't going up everywhere. But, just the same, the market for copper roofing is big and broad enough to mean real business to the sheet metal trade throughout the country. On monumental buildings, on public buildings, on churches, schools, clubs and many, many houses—sheet copper roofing is business for *you*.

So remember that Anaconda offers 10-ounce and heavier sheets to give you an interesting price

range. Remember, too, these principal advantages of Anaconda Copper: It is durable, fire-safe, light in weight and reasonable in cost. It is architecturally correct; age only increases its attractiveness.

Yes, copper roofing means business for sheet metal men. Have you a copy of our 72-page 10-ounce Installation Manual?

Visit the Copper & Brass Industry Exhibit in the Hall of Industry, New York's World's Fair—1940



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## Anaconda Copper

THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONNECTICUT

In Canada: Anaconda American Brass Ltd., New Toronto, Ontario • Subsidiary of Anaconda Copper Mining Company

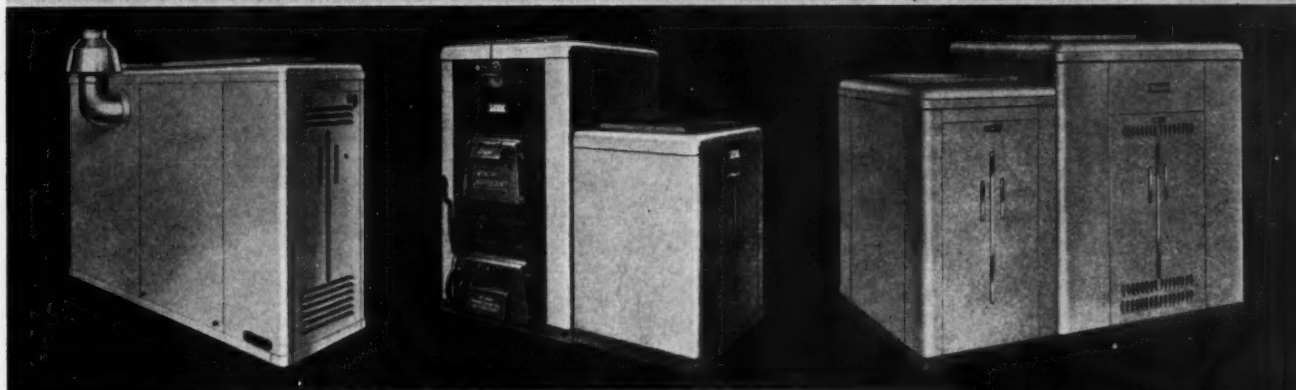
# Complete **MONCRIEF** Line

## ENLARGES YOUR PROFIT OPPORTUNITIES

ARISTOCRAT GAS-FIRED  
WINTER AIR CONDITIONER

ARISTOCRAT COAL-FIRED  
WINTER AIR CONDITIONER

ARISTOCRAT OIL-FIRED  
WINTER AIR CONDITIONER



### Aristocrat Winter Air Conditioners ↑

Get acquainted at once with all that the Moncrief Winter Air Conditioners offer in design, efficiency and convenience. Whether the house be large or

small, Moncrief can supply a unit of exactly the right size and type, specially designed for burning coal, oil or gas, with economy. All attractively priced.

### Warm Air Furnaces →

Whatever the call for a furnace, cast or steel, you can meet it best with a Moncrief. All Moncrief Furnaces are made of qual-

ity materials, present features that give you strong selling points. Priced to give real values and pay you good profit.



### NEW This Year DELUXE LONG LIFE

*With 20-Year Guarantee*

If you want to get away from price competition, and sell a gravity furnace on merit and long time satisfaction, here is the unit for you. It presents style, guaranteed quality and convenience. This is your big profit opportunity for 1940.

*Let us explain the Moncrief Proposition.*

**THE HENRY FURNACE & FOUNDRY CO.**  
3473 East 49th Street Cleveland, Ohio

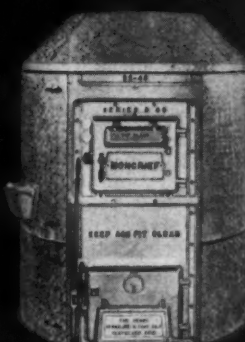


*Moncrief Supplies Everything Used on a Warm Air Heating and an Air Conditioning Job.*

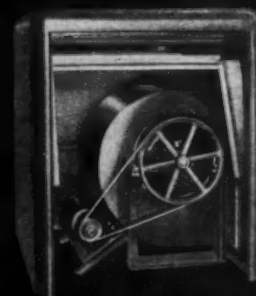
SERIES  
"C"  
CAST  
FURNACE



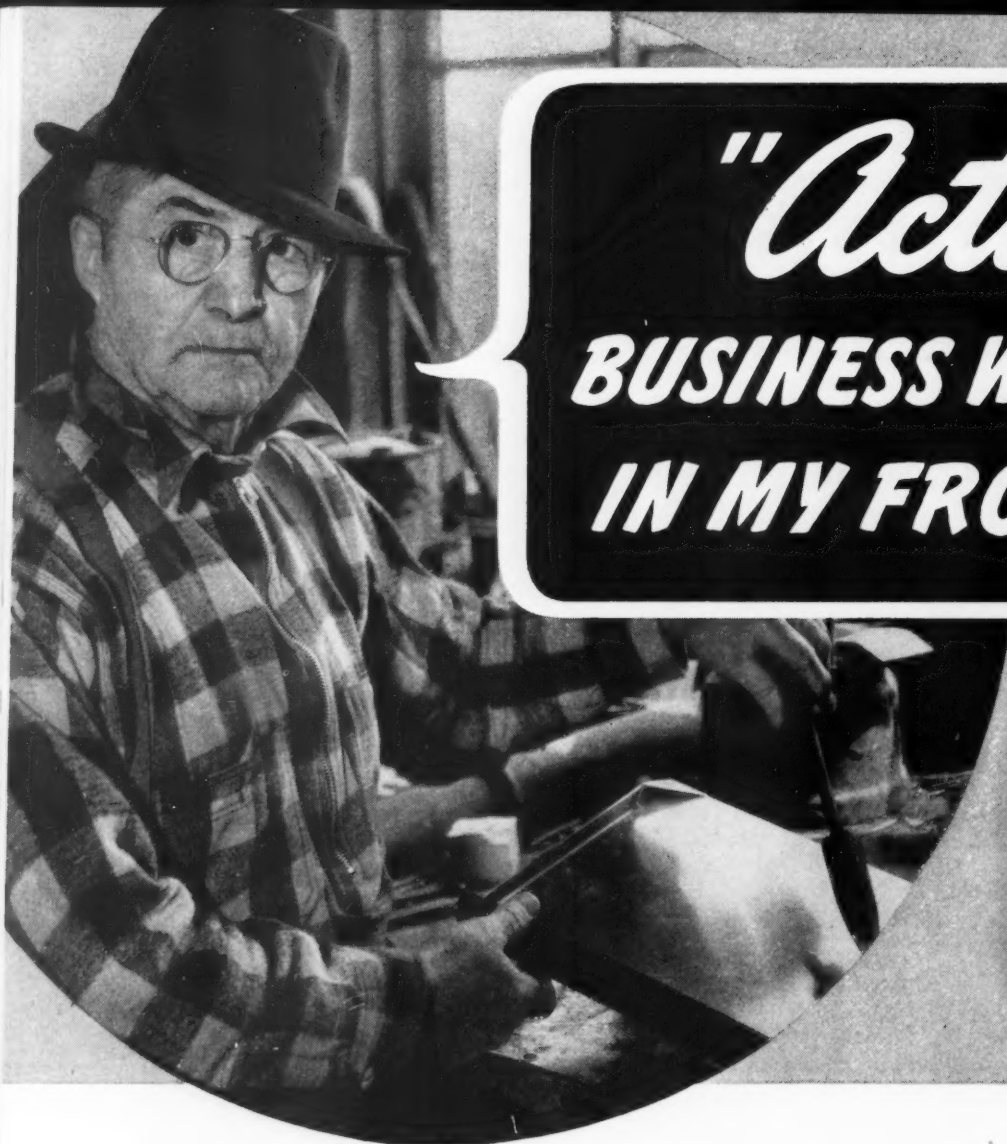
SERIES  
"D-40"  
STEEL  
FURNACE



MONCRIEF  
BLOWER-  
FILTER  
UNIT







*"Actually,  
BUSINESS WAS WALKING  
IN MY FRONT DOOR"*

Twelve years ago, Mr. Leon Studer of Massillon, Ohio, made an aquarium of Republic ENDURO\* Stainless Steel. From this modest start has grown a healthy business—but let Mr. Studer tell you in his own words—

● "Twelve years ago, I made a fortunate and profitable decision. I decided to jump into the stainless steel business with both feet, because here was something new that had immense possibilities.

"My first products were a fish aquarium, a weather-vane, a tea kettle and a coffee pot. They showed customers and prospects what this new-fangled material called stainless steel looked like and proved that I knew how to fabricate it.

"Soon I discovered the application that paid dividends... drainboards and sink bowls. After I had installed a few of these, people began visiting my shop, calling me on the telephone, asking me for information on stainless steel. No longer did I need to pound pavements. I had something people wanted and they came after it. Actually, business was walking in my front door.

"This development has continued through the so-called 'dark thirties' when people were supposed to be buying the cheapest in everything, yet I had no trouble in obtaining standard prices for my stainless steel jobs.

"Today, fifty per cent of my business is ENDURO Stainless Steel. Because I am a fellow who wants to enjoy life

while I am here, I have purposely limited myself to a small shop, with my son as a partner. We form all of our stainless steel by hand. The only piece of sizable equipment is an eight-foot brake.

"A comforting thought is the fact that this stainless steel business is still in its infancy. Any contractor who hasn't taken advantage of its possibilities should make up his mind now to become a specialist in stainless steel. He will discover as I did that it will prove profitable.

"I have tried several different stainless steels, but long ago I standardized on ENDURO. I prefer ENDURO from every standpoint, but it has two qualities especially that help my profits. Its ease of fabrication keeps my cost down and its attractive appearance keeps customers happy."

*After this, the most helpful advice we can offer is—get a copy of the Republic ENDURO Fabrication Book, free to any sheet metal contractor or craftsman writing to Republic Steel Corp., Alloy Steel Div., Massillon, Ohio; General Offices, Cleveland, Ohio.*

\*Reg. U. S. Pat. Off.

**REPUBLIC ENDURO**  
*Stainless Steel*



BERGER MANUFACTURING DIVISION  
NILES STEEL PRODUCTS DIVISION  
STEEL AND TUBES DIVISION  
UNION DRAWN STEEL DIVISION  
TRUSCON STEEL COMPANY





# American ARTISAN

Vol. 109

No. 6



## National Contractors Organization

Last January, in Cleveland, two efforts were launched to organize the heating-sheet metal contractors into a national association. At the National Warm Air convention a committee was appointed to study dealer problems and provision was made to accept dealer memberships in that organization.

At the same time, the secretaries of state associations formed a national contractors group, opened an office, appointed a secretary, and began a drive for membership.

Nearly six months have passed since those meetings. Meanwhile the states have held their annual conventions. Some states joined the contractors association as a body; some explained what had transpired in Cleveland and invited state members to join the national body. The struggle of the national contractors organization has been hampered by a lack of funds, but mostly by the inability of scattered groups, without any central guiding hand, to get together for a concerted drive.

A few dealer memberships have been secured in the National Warm Air. Presumably the manufacturers have tried to get their dealers to join the National Warm Air. Also, one man has been given the job of explaining the advantages of this arrangement to every possible gathering of contractors but one man, even full time, can't carry the story to 30,000 contractors across the country.

The net result, for both organizations has, to say the least, been discouraging.

As we see it, the trouble is that there are too many problems, too many sore spots, for even the best intentioned of men to solve "in between times." These problems form the very heart and soul of the warm air heating industry. There are problems of manufacturers' relationships with dealers; problems of manufacturers' sales policies to recognized dealers and builders; problems of manufacturers selling to men who never should be in the heating business. There is the tremendous problem of contractors unwillingness to see their competitors' side of any given argument. There is the downright distaste of contractors to air their vital problems in front of competitors.

And, finally, there is the lack of good, sound sales reasons why the contractor should join either group. Just the appeal to belong to a national group; to pay out good money and get diaphanous promises; to get some benefit "when, as and if" is not enough.

There are many substantial, proven benefits

from national association. But a program which really offers concrete benefits cannot be put together in a one day meeting by a few men, no matter how conscientious these men may be. If this industry is to have a national contractors association, some means must be found whereby a group of hard working men, representing all activities of the industry, can sit down *indefinitely* and set up a program.

## Heating Low Cost Houses

For several months the editors of AMERICAN ARTISAN have been gathering ideas, plans, costs, photographs of heating systems for low cost houses. Particularly the house selling for \$4,000 or less. Our reason for this effort is twofold—First: Houses selling for less than \$4,000 are increasing in practically every community thus becoming more and more an important field for the sale of our equipment. Second: If the warm air heating industry does not perfect equipment and installation ideas to heat the \$4,000 house for the offered 5 to 6 per cent of the cost price, the parlor heater industry will take this business away from us.

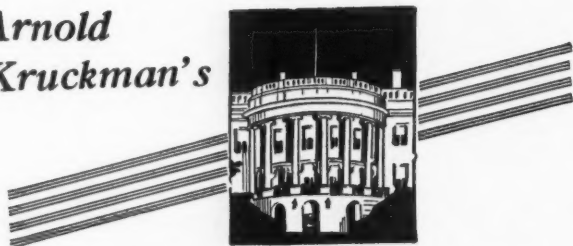
The problem, as we see it from intimate study, is not a problem of equipment. Our manufacturers have every conceivable type of equipment necessary. We have closet furnaces, attic furnaces, horizontal furnaces, compact basement furnaces—we have furnaces for coal, oil and gas—we have gravity and mechanical circulation units—we have units ranging in output capacity from 35,000 Btu to 100,000 Btu. And almost every wished-for price range is included in the list.

But installation of these fine pieces of apparatus is a more difficult problem. A house selling for \$4,000 probably cost about \$3,500 to build. Five to six per cent of \$3,500 is about \$200. If the apparatus costs \$60 to \$110 there isn't much left for sheet metal, fabrication, installation, overhead and profit. In fact, there is mighty little left for these necessary items.

The solution lies in ingenious methods which reduce the amount of duct work required to the minimum; in methods which make it possible to install the complete system in not more than two days labor time; and a willingness to accept a low net profit in the hope of securing a volume of work.

These problems have been kept constantly in mind in searching for typical, ingenious ideas. The result is a special section which will appear in the July AMERICAN ARTISAN.

Arnold  
Kruckman's



## Washington Letter

### Rural Electrification

**G**OVERNMENT officials roughly estimate there are between 260,000 and 300,000 farmsteads, recently electrified by REA, that are genuinely potential customers for mechanical warm air heating, attic ventilation fans, automatic heating devices, fan-filter units, electric controls for heating systems, and similar equipment. To make their estimates conservative, they took into account only those farms which have had electricity for at least eighteen months. Their experience reveals that in the beginning the farmer and his wife install the more obvious things, such as lights, radios, kitchen equipment, bathrooms and water pressure systems. As the novelty of these things wear off they begin to consider installation of other equipment.

### What the Farmer Buys

The REA, EHFA, FHA, FSA, FCA, and other agencies that finance, with Government funds, the purchase of various equipment by farmers, have kept accurate records of the transactions in the electrical wares; they can tell you to a fraction how many radios are purchased and how many electrical irons are bought and how many bathrooms are installed; but they have not kept such meticulous records to cover warm air furnace fans, stokers, oil burners, and similar equipment. They know there have been increasing purchases, and they know the number is growing healthily; but since the REA itself does not finance these acquisitions directly, the REA has not kept the figures. The funds to finance these purchases are supplied either by Electric Home and Farm Authority, Federal Home Administration, Farm Security Administration, or through the various agencies of the Farm Credit Administration. And there are still other Government agencies that provide funds. There is plenty of money to help the farmer finance his purchases, according to the confident statements of Government officials.

Here in Washington they say the chief problem must be handled by the dealer, the service man and the manufacturer. REA and EHFA people will convince you with their enthusi-

iasm that the market is there; it simply requires the effort of the business man to develop it. They know, for instance, that the farmers are eager to buy attic ventilating fans; they have learned from their records that 10% of the farmers who have electrified their farms have invested in warm air heating installations operated by electricity. They know that in many of the 700 small towns adjacent to electrified farm areas (having an average of 800 farms each on the "High Line") dealers have sold warm air furnace fans, stokers and similar equipment.

### Growth of the "High Line"

They point out that roughly 300,000 more farms are in process of being placed on the "high lines" during this year and that the farmers, according to past averages, will spend approximately \$500 per farmstead. This means, according to Government figures, that \$400,000 will be spent for various equipment in each of the 375 communities affected. They tell us that three-fifths of this business will be paid for with money furnished by the Government. The other two-fifths is paid out of the farmer's own funds, or provided by his own credit.

The records also reveal that there is a smaller group among the farmers, who benefit by the "high line," who do not use Government funds or Government credit. They pay cash or use their own credit. Although this group is a very definite minority it constitutes a substantial and profitable proportion of the potential customers. The Government keeps no tally of these private transactions, but the Government agencies do everything in their power to encourage this business.

### The Cooperative "Project"

Under the REA, farmers on the "high lines" are organized into Projects. The Project is, in realistic terms, a Cooperative. The story of the operation of these cooperatives, how they are conducted and how they function, is a fascinating story in itself which we cannot go into here. But it is necessary to realize that the Cooperative is the core of the REA system, in order that the business man

may know how to tackle the business of selling the farmers on the "high line." The 700 communities which the Cooperatives head-up, are located in all the States of the Union. If you wish to know where to find the Cooperative nearest to you write to the Rural Electrification Administration, Washington, D. C.

### How Cooperative Acts

The Cooperative will help any dealer to get the business he wants to go after. The Cooperative will give you a list of the farmers on the "high line" and its officials will actively campaign among the members of the Cooperative to help you sell. They will give you the credit rating of the individual farmers, and they will expect you to qualify your standing as a reliable business man for the benefit of their members. The Cooperative is the agent of the Federal Government and as the agent for the Government and for the community, it will make the collections monthly that will repay the Government for the money it has loaned to the farmer to pay you for whatever he buys. When he signs a contract to buy your wares or service he pays a certain proportion in cash, and the Cooperative then takes the contract and cashes it with the Government finance agency that is competent to handle the transaction. You get your money within from 7 days to 21 days after the contract is signed.

### Few Defaults

Officials of the Federal Government find that transactions involving attic ventilating fans, fan-filter units, stokers and similar installations are the soundest risks they accept. They say there has been practically no default among the farmers who have purchased this type of equipment. And they volunteer the interesting sidelight that there is an amazingly increasing business in this field in the urban communities, especially among those persons who have built homes with FHA insured loans amounting to \$4,000 or over.

### REA Traveling "Show"

They do not anticipate that this type of business will flourish largely, immediately, in the \$2,000 to \$2,500 homes that are being built in all parts of the country. They suggest that these low-cost houses for low-income people should provoke the production of new equipment, with similar purposes, that may be purchased at lower prices. Incidentally, all agencies report with complete unanimity that single-family homes are filling up with unparalleled swiftness, and that vacancies in apartments are increasing with corresponding speed. It is reported that 9 out of 10 apartments increasingly show vacancies while in some communities there are no single-family homes to be had.

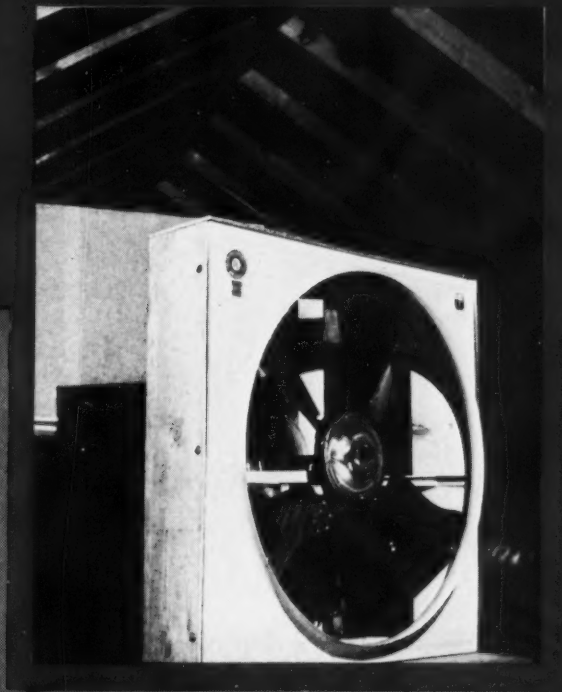
(Continued on page 112)



AMERICAN ARTISAN

# RESIDENTIAL AIR CONDITIONING

S E C T I O N



DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING





# Pacific

## DEALERS

Write for 150-page catalog describing our complete line of furnaces, space heaters, water heaters and allied items. Valuable territory still open. Write or wire . . . NOW!

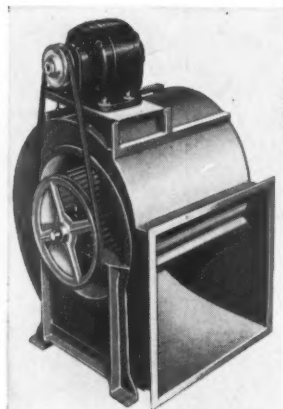
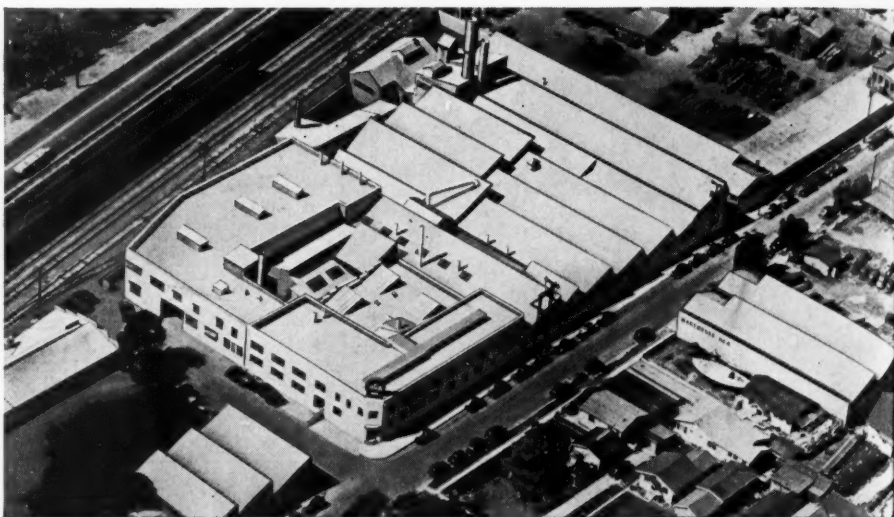
HUNTINGTON PARK, CALIF., JUNE, 1940

## NEWLY ENLARGED PLANT ON CAPACITY PRODUCTION

### Demand for "Pacific" Products Reflects Quality Due to 27 Years' Specialization in Manufacture of Gas Heating Appliances

**B**Y RAIL, highway and water large daily shipments of Pacific Products are speeding to every corner of the country to meet the steadily growing demand for these time-tested, ultra-modern gas heating and ventilating appliances. This industrial progress is the result of consistent and specialized development of Gas Heating Equipment over a period of 27 years combined with a company policy that adequately protects Pacific Dealers and Customers.

Pacific embraces a complete line of Forced-Air Winter and Summer Air-Conditioners . . . Gravity Units . . . Blowers . . . Floor Furnaces . . . Cabinet Heaters . . . Gas Steam Radiators . . . Wall Heaters and Water Heaters for Natural and Manufactured Gas fuels.



### Forced-Air Modernization With "Pacific" Blowers Is Profitable "Plus" Business!

A fertile field awaits cultivation by Pacific dealers who are prepared to modernize gravity furnaces with blower installations. Both the economy of forced-air circulation of heat and the advantages of summer ventilation appeal strongly to owners whose gravity furnaces are in good condition and which they would not consider replacing. Furthermore, Pacific Multi-Blade Blowers are available in sizes and capacities to meet all residential and many industrial requirements. With these Blowers you can easily secure good business over and above the limitations of the market for new gas fired furnaces.

### New Blower Furnace Features Cast-Iron

NEW "EVERLAST" CAST IRON FURNACE. Sectional fin-type cast iron radiation element and burner box combined . . . built-in blower with fully automatic controls . . . this is the winter-summer Air-Conditioner for heavy duty in extreme climates!



Write Today for New Free 150-Page Catalog

Full product data with specifications and illustrations on the complete Pacific Line. Ask for it on your company letterhead TODAY!



## PACIFIC GAS RADIATOR CO.

MAIN OFFICE AND FACTORY  
HUNTINGTON PARK • CALIFORNIA



"Air Conditioning"  
THAT'S THE NEW  
SALES WORD

*"The Line of Least Resistance"*

### New Air-Insulated Wall Register Models



SINGLE WALL REGISTER

Never before such simplicity of installation . . . such all 'round convenience! By all means see this new Single Wall Register model. Study its features and wider adaptability to your needs.



DUAL WALL REGISTER MODEL

Heats two rooms with great economy. Properly sized for residential requirements. New fabricated steel grilles are more efficient. Furnace is replete with new selling features.

### New Stocking Plan -- Interchangeable Controls

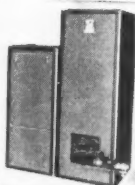
Think of this! With TEN standard types and sizes, THREE Interchangeable Burner packages, and TEN Interchangeable Control packages (complete manifold assemblies) you can supply, right out of stock, 300 different Floor Furnace Models complete . . . the RIGHT SIZE, the RIGHT BURNER, and the RIGHT CONTROLS for the job . . . no matter how "special" the owner may try to make it!

Complete details of this new and spectacular PACIFIC plan are available for the asking. The plan reduces stock investment, simplifies installation, assures the owner a properly sized and properly equipped Floor Furnace installation every time.

Keep abreast of the times by investigating these new furnaces now. With them you can make floor furnace merchandising history!

### The Ideal Replacement Unit

Here is the ideal replacement unit for switching old house gravity jobs to modern forced-air. Fits in low ceiling basements. All the famous Pacific quality at a price!



### New Gravity Furnace

New gravity furnace with double wall outer casing, inner shielded round heating element, multi-tubular burner . . . a marvel of efficiency and low cost operation.

er . . . a marvel of efficiency and low cost operation.



## "Attic Ventilation," For Commercial Spaces Is Solicited by Krauss Engineering

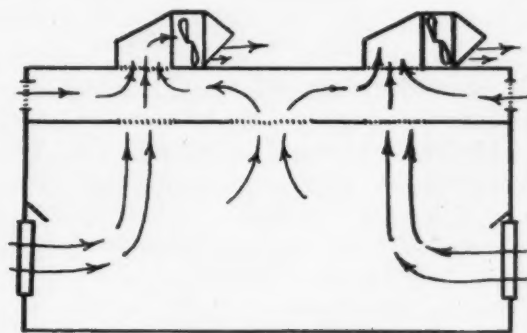
WHILE attic ventilation-night air cooling in New Jersey cities has not yet reached the "thousand fan sale" reported from cities in other parts of the country, this method of obtaining summer comfort has been making steady progress throughout the state.

Attic fan sales in most New Jersey communities, up to date, have been made the "hard way." Pioneering began several years ago, but there have been no spectacular booms in fan sales and few large scale, cooperative advertising campaigns in which utilities, contractors, manufacturers and others share the expense and actively promote the idea.

Those engaged in the sale of attic fans throughout New Jersey report, however, that progress has been steady and that climate favors this method of cooling. Night air temperatures decrease substantially from daytime temperatures, houses are constructed so that fans can be

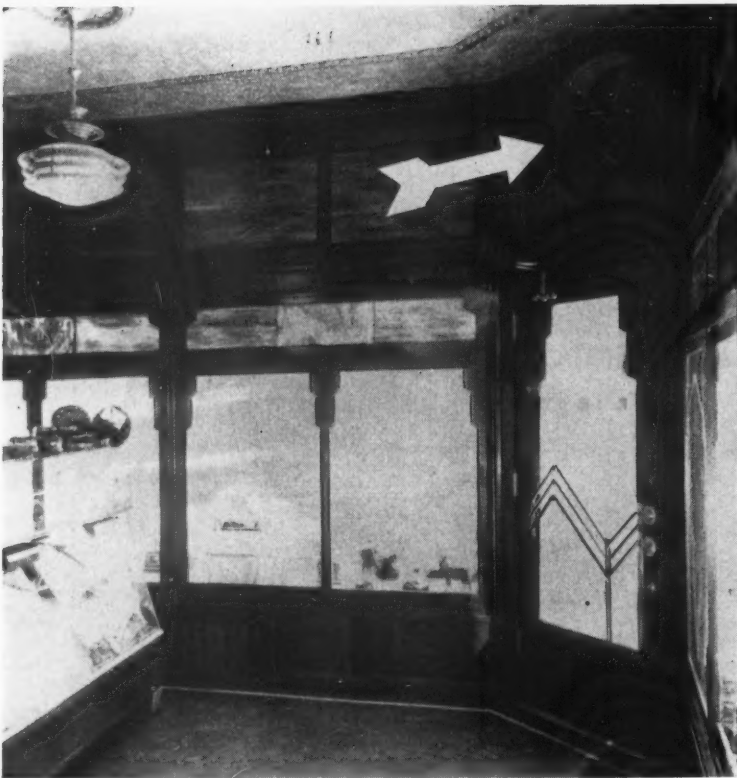
installed without too much alteration and commercial prospects are becoming increasingly interested.

The experiences of the contractor in New Jersey are illustrated in the sales effort of Krauss

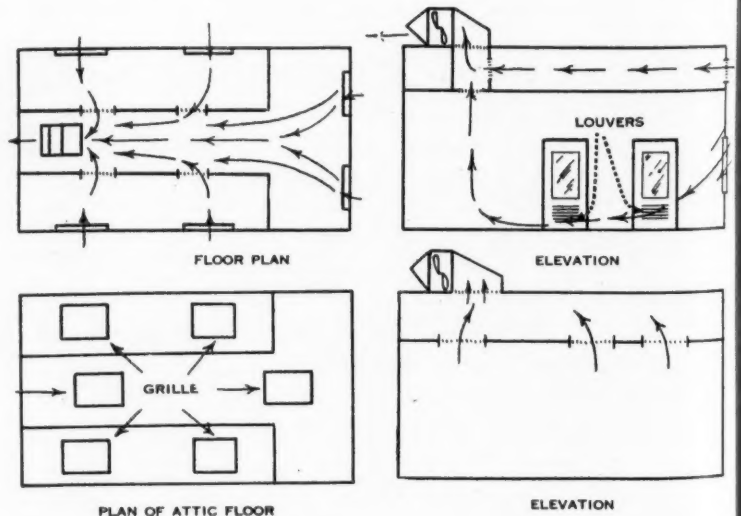
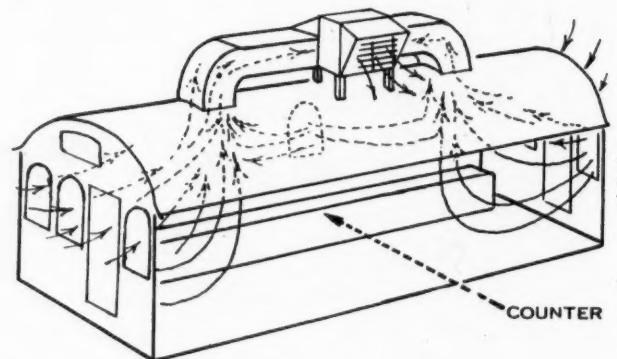
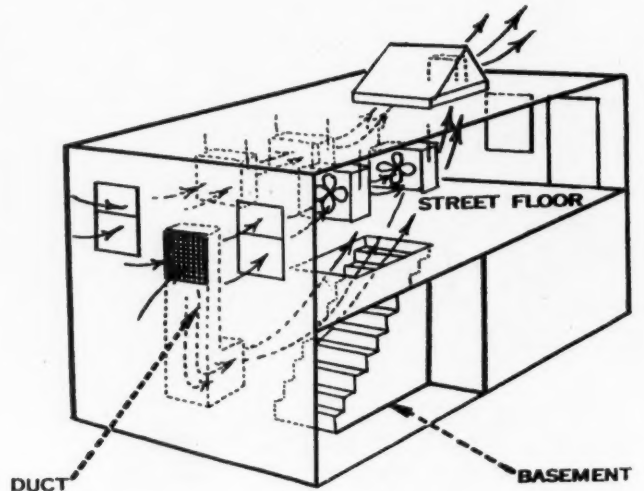
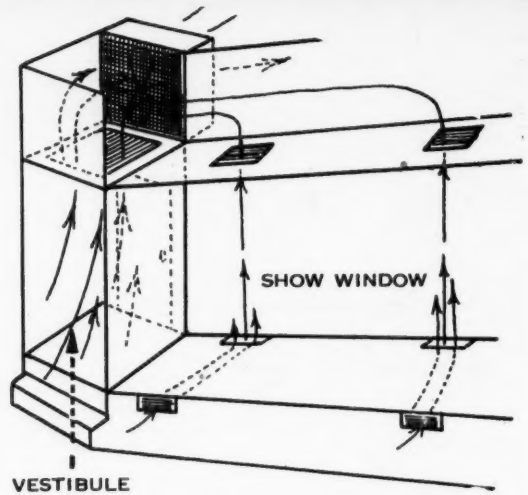


At the top of the page and in the elevation are shown attic fans installed in a tap room and restaurant. Air exhausts through the grilles into the false ceiling, then out of doors through the fans.





The photograph and the top diagram show a vestibule installation for a bakery. Air is also withdrawn from the show window to relieve sweating. Second sketch down—Variety store. Air is passed through the basement, then first floor and out through the roof. Third from top—Lunch wagon system. Bottom—Office building installation showing variations of a false ceiling intake.



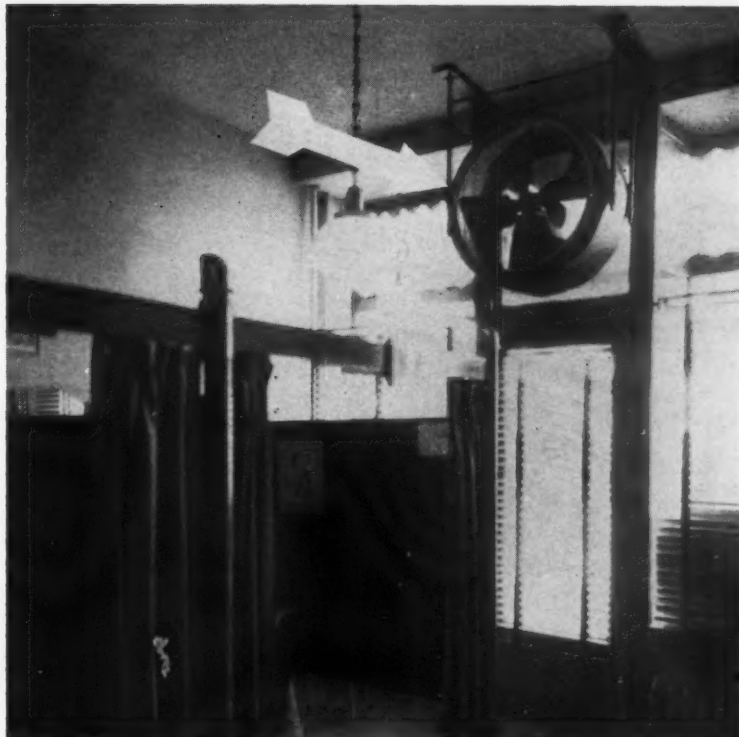
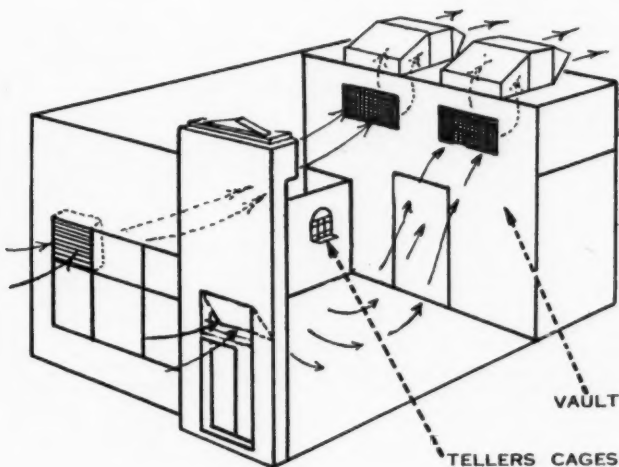
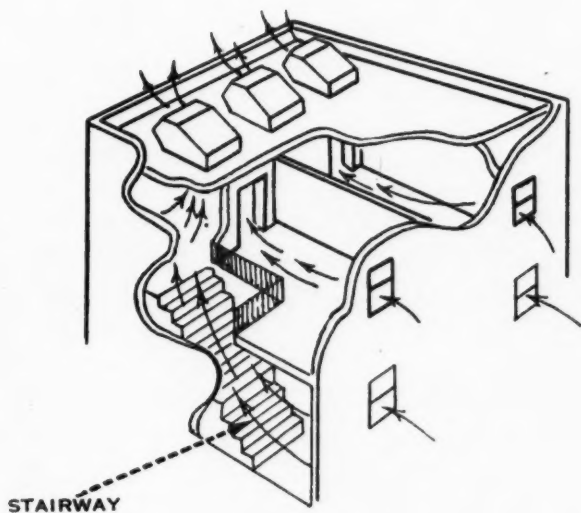
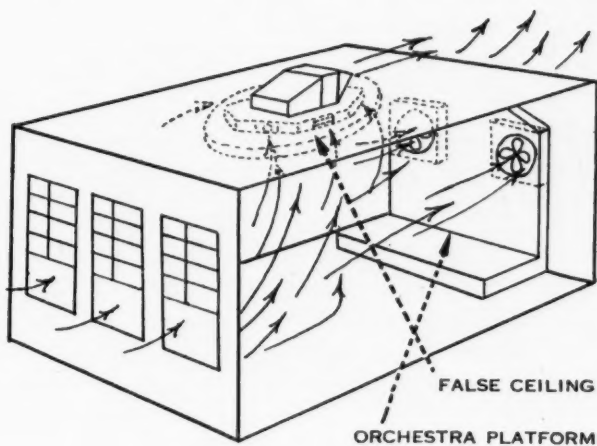
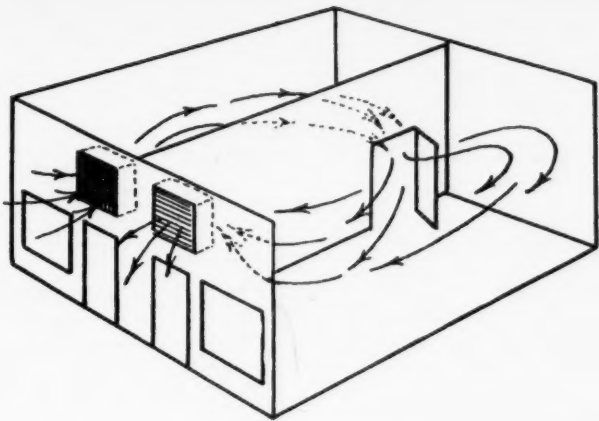
Engineering of East Orange. G. A. Krauss pioneered attic fan sales in his area, giving lectures to utility groups, contractor groups, jobber-dealer meetings. The underlying theory, engineering design, sales methods have been explained to these groups by Mr. Krauss from his own experiences.

After several years of effort, Krauss Engineering has come to be recognized as an authority and ticklish problems in the area gravitate to the firm's engineers. Of particular interest is the wide variety of places in which this organization has installed attic fans, especially commercial installations. The illustrations show a number of these installations and prove, among other things, that this method of cooling is, indeed, versatile.

Krauss Engineering has handled and now handles several makes of fans. Large diameter, small diameter; high speed, low speed; housed, unboxed fans are employed to meet the many problems of the widely different installations made by this organization.

Comparatively simple engineering design is followed. In all cases one air change per minute per cubic foot of space ventilated is insisted upon. If the installation appears to have higher than normal resistance to air flow, additional capacity (up to a capacity of one air change each one-half minute) is incorporated so that when finally





The photograph and the top sketch show a beauty parlor with two fans (one draws air in; the other blows air out). Second sketch down—Night club with camouflage ceiling which acts as an intake for the fan. Other fans exhaust to the rear. Third sketch down—Apartment house fan battery showing air travel upward with complete exhaust for the top floor. Bottom-Bank installation with one set of fans pulling air in and another set pulling air out.

turned on the one minute air change will be obtained.

In each case the flow of air into the space ventilated, the flow to the fan and the flow out of the building is carefully studied so that the fan can be located for greatest efficiency or for adequate air change in every section of the space. The wide difference in fan and grille locations which result from such study are illustrated in the several diagrams showing actual installations made by the Krauss organization. Of course, in these installations, some of the particular problems of the space served also controlled equipment and grille location.

The illustrations cover mostly commercial installations which form a very large part of the annual business of the Krauss organization. In most of these commercial installations there is no attic space for the fan or the attic space can be used more advantageously as a collecting plenum for the fan, so usually the fan is placed outside the building in a small fan housing. This procedure is standard practice in commercial work of the Krauss designers.

Probably the largest commercial installation of this type was installed by Krauss in a Paterson, N. J., market where a million and one-half feet of air has to be moved each minute. Nine fans, each moving 22,000 cfm, were installed on the roof in the skylight. Sixteen other fans, each

(Continued on page 118)

# Cooling A Small Dress Shop

By E. R. Ross

Bevington-Williams, Inc., Indianapolis

The small commercial establishment seems, today, to be the likeliest sales field for the air conditioning contractor. Mr. Ross, the author, with many years of active experience in this field, will write three articles, each setting up a step-by-step design procedure for a certain type of small commercial establishment.

THE telephone rings and an anxious voice on the other end wants relief from the summer heat. It develops that a lady wants her dress shop cooled. Immediately a mental picture is formed which describes a routine procedure as follows:

1—A trip to the shop in question to determine:

- (a) Size of building and particularly of the space to be cooled.
- (b) Availability and characteristics of prime necessities such as power, water and drainage.
- (c) Construction of the building and its peculiarities.
- (d) Direction building faces and its relation to rays of the sun at various times of the day.
- (e) Number of lights, location and total

wattage in space to be cooled.

- (f) Obtain from client the number of employees and customers to figure on.
- (g) Obtain from client available space for equipment, ductwork, etc., and whether there is to be any additional remodeling done at the same time that cooling is added; which fixtures are permanent, which are movable, etc.
- (h) Space owned or leased; who pays for utilities such as electricity, sewer tax, water, etc.

2—Heat gain calculations.

3—Selection of type of system, air distribution, control, etc.

4—Selection and arrangement of equipment.

These preliminaries investigated and tabulated, our dress shop becomes:

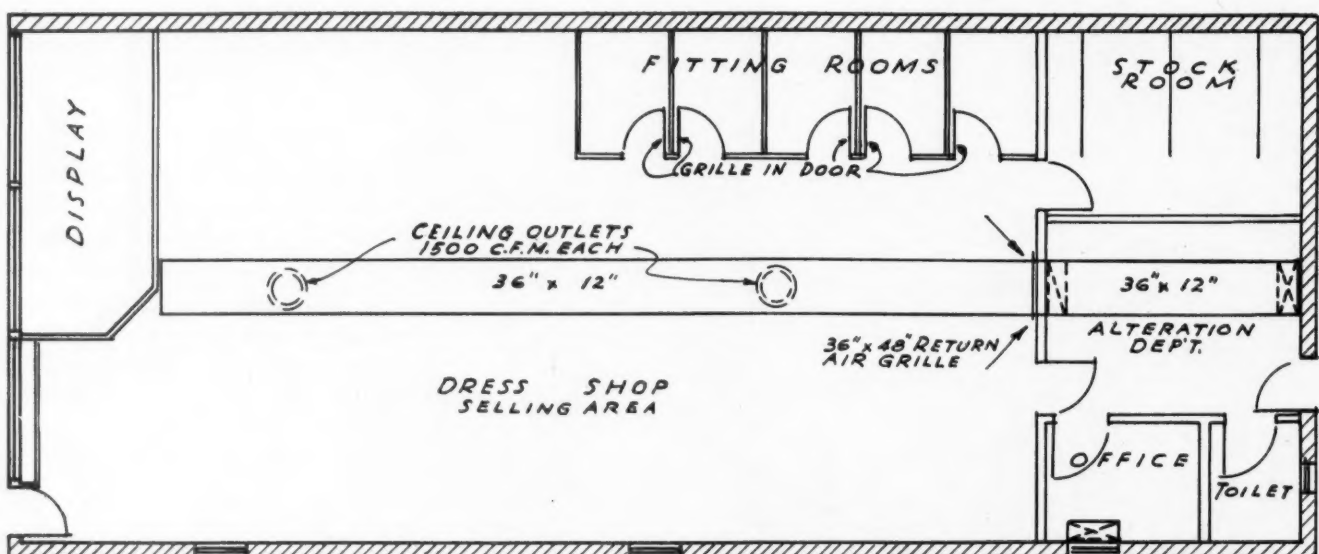


FIG. 1 FLOOR PLAN SHOWING  
FIXTURE AND DUCT LAYOUT

Table 1  
Heat Gain Calculations  
Internal Sensible Heat Gain

TRANSMISSION THROUGH WALLS					RADIANT SUN EFFECT	
EXPOSURE	Sq. Ft. AREA		COEFF. OF HEAT. TRANS.	TEMP. DIFF.	BTU. PER HOUR	BTU. PER HOUR
					PER Sq. Ft. AREA	
West.....	Gross	360				
	Windows	240	1.13	15°	4,070	46
	Net	120	.25	15°	450	5
South.....	Gross	720				
	Windows	18	1.13	15°	305	9
	Net	702	.25	15°	2,630	13
North partition...	Net	720	.25	10°	1,800	
East partition.....	Net	360	.35	10°	1,260	
Ceiling.....	Net	1,800	.18	15°	4,860	37
Total.....					15,370	27,113

People Load = 20 x 225 = 4,500 Btu. per hr.  
Light Load = 4,000 Watts x 3.4 = 13,700 Btu. per hr.

Our total internal sensible heat load will then be:

27,113 Btu (Radiant sun effect)  
4,500 Btu (People load)  
13,700 Btu (Electric light load)  
15,370 Btu (Transmission load)

60,683 Btu

The air required for cooling will be:

60,683

$\div 20 = 3,000$  c.f.m.

$1.08 \times 19^\circ$

Our internal latent heat gain will be:

People load  $20 \times 180 = 3,600$  Btu per hr.

Our heat gain due to ventilation air will be:

Sensible = c.f.m. outside air  $750 \times 1.08 \times (95^\circ$   
outside air —  $80^\circ$  inside) = 12,300 Btu.

Latent = 750 c.f.m.  $\times 4.5$  (latent heat per lb.  
@  $67^\circ$  d. p. — 14.97 — (room d. p. temp.  
 $60^\circ$  — 11.69) = 11,100 Btu.

Our total heat gain will be:

Internal Sensible Heat.....60,683

Ventilation Sensible Heat.....12,300

Total Sensible Heat.....72,983

Internal Latent Heat..... 3,600 Btu/hr.

Ventilation Latent Heat.....11,100 Btu/hr.

Total Latent Heat.....14,700 Btu/hr.

Total Heat or Total Load on

Compressor .....87,683 Btu/hr.

Table 2  
Design Temperatures

TEMPERATURE	DRY BULB	WET BULB	DEW POINT
Outside.....	95°	75°	67°
Room.....	80°	67°	60°
At grille.....	61°	60°	59.5°
Enter coil.....	84°	69.1°	62°

General building description (as per plan shown in Fig. 1).

- 1—Floor area 60 by 30 = 1,800 sq. ft.; ceiling height, 12 feet.
- 2—One-story building located on alley and facing west with north wall a party wall to adjoining building.
- 3—Utilities of ample size and enter at rear of building in basement.
- 4—Observation indicates that building to south of alley will not shield south wall

from solar exposure and actual solar exposure must be figured for roof and west wall, including glass, although this condition is helped by the use of awnings.

- 5—Wall construction, 12-inch brick with metal lath and plaster on interior.
- 6—Roof construction of built-up type with 1-inch cork insulation and 6-inch dead air space between roof and plaster ceiling on metal lath.
- 7—Glass windows consist of two small 3-foot



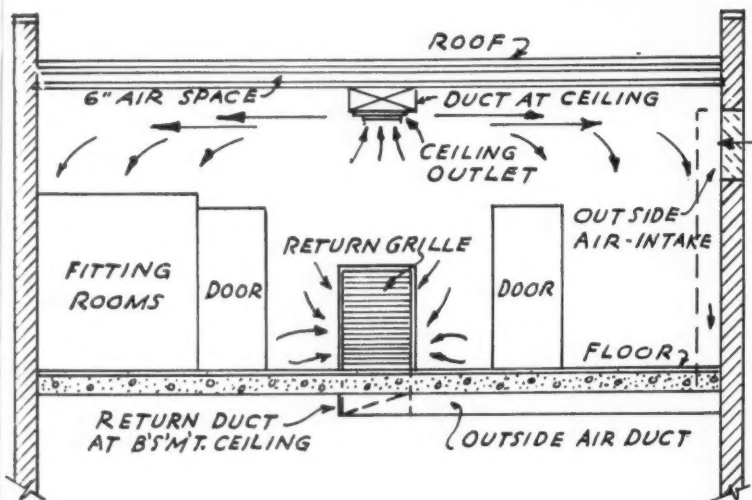


FIG. 2. CROSS SECTION OF BLDG.  
LOOKING TOWARD REAR OF STORE

by 3-foot windows in south wall, display window and door 8 feet high and full width of building in west wall. Display window at front open to building interior.

- 8—Basement under entire building used only as stock storage.
- 9—Space to be cooled includes entire sales area and fitting rooms, but not private office or stock room at rear of building.
- 10—Interior decorations and architectural treatment lend themselves to the use of ceiling ducts and diffusers for air distribution.
- 11—Light wattages total 4,000 watts.
- 12—Occupancy—20 people.
- 13—Basement space in rear only available space for equipment.
- 14—Client does not expect to do any extensive remodeling at this time. All fixtures are movable, including partitions that form fitting rooms. Fixture arrangement is changed periodically.

These data converted to heat load are shown in Table 1.

#### Duct Work and Controls

Inasmuch as there will be no other remodeling done at this time, existing decorations must be considered in connection with expenditure. It is not possible to locate ducts above the ceiling. There are two rows of light fixtures. A duct down the center affords the best distribution, will not unbalance the ceiling layout and meets with the client's approval (all important items).

The center duct also lends itself well to ceiling distribution. This means outlets placed in the bottom of the duct of a type which will distribute air in all directions parallel to the ceiling (Fig. 2)

to insure absolute coverage. Best results are achieved (regardless of the type of distribution outlet used, whether sidewall or ceiling) when the cold air blankets the ceiling to form a plane above the working space and drops of its own weight—the colder air being heavier than warm air. This eliminates down drafts or spotty cooling as the downward movement is by gravity and the gravity flow is well within allowable velocities for noticeable drafts.

The partition between the selling area and back rooms affords a handy location for the return air grille.

The manager of a dress shop will not normally be mechanically minded so that a control system which affords the least amount of care, adjustment, etc., must be considered. A thermostat which can be adjusted is located in the cooled space. This thermostat will be automatically reset by a thermostat in the outside air intake so that as the outside air increases in temperature the inside temperature range will also be increased, but not as much. This eliminates any shock encountered when going from the extremely hot outside to a very cool interior. The inside thermostat controls the operation of the cooling coils which in turn are fed by the compressor.

The fan will be running all the time controlled only by a starting button. There should be a relay between the compressor motor and the fan motor to prevent the compressor from operating unless the fan is running. The outside air intake is sized for 100% outside air, but should have an automatic damper which will have a minimum setting of 25%. An auxiliary switch located next to the fan starting button will provide for any other setting from 25% to 100% outside air. This means that normally when the fan is started the outside air damper opens to provide 25% outside air and when the fan is stopped the damper closes. On mild days, by opening the damper

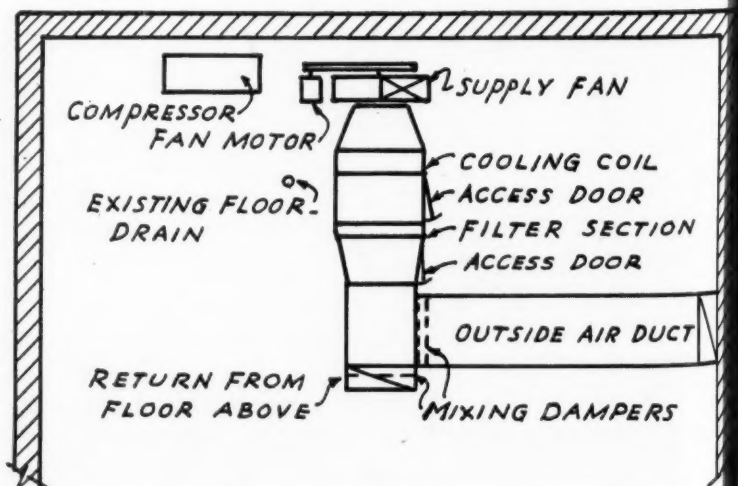


FIG. 3. PART PLAN OF BASEMENT  
SHOWING EQUIPMENT LAYOUT.

beyond the 25% setting, it will be possible to save on the compressor operation by drawing in more cool outside air.

#### "Package" or "Built-up" Equipment

In the selection of the equipment it is necessary to consider the space requirements. Where there is ample space, such as is the case here, the question boils down to a cost proposition, comparing a built-up arrangement as compared to an insulated, self-contained, central station unit incorporating a compressor, cooling coils, filter and a fan. Both would incorporate the same fan capacity, the same amount of filter area and cooling coil surface and do the same amount of work.

Assuming the built-up unit to be the cheaper, a basement layout (Fig. 3) is made. This clears up the complete picture as the outside air can be taken from the high window in the south wall off the alley, the duct dropping down the south wall flat against the wall and turning north on the basement ceiling connects into the intake housing before it reaches the filters.

The cooling coils are close to the existing floor drain so that the drain pan under the cooling coils can have a drain pipe running over to the floor drain. The housing between the cooling coils and fan; the fan and the discharge duct from the fan to the place where the duct passes through the partition into the cooled area, is insulated to prevent condensation.

#### Duct Work and Openings

The supply duct is run 36 x 12-inches the full length for economy, appearance and because there would be nothing gained in reducing its size once. We decide to divide the room in half, making two equal squares 30 ft. x 30 ft. In the center of each of these squares we will place a ceiling type grille for a 15-foot throw with a volume damper behind. We place a 12 x 12-inch, door type, sight-proof grille in the bottom of each fitting room door. A return air grille with a multi-shutter damper behind, sized for not to exceed 300 feet per minute velocity, is placed in the center of the rear partition wall.

A cleanable viscous type filter is selected with a recommendation that the client arranges for a filter maintenance contract with a company that handles that type of work.

The selection of a cooling medium must be done before the cooling coils can be selected. Well water if 55° or cooler and in sufficient quantities would be satisfactory. City water of the same temperature and if not too expensive will do the same job. Chilling water and circulating the chilled water will do the job, but this arrangement does not prove economical on small jobs.

Let us assume that well water is not available

and city water between 70° and 75° eliminates any of the above so that the use of a refrigerant as a cooling medium presents itself. Performance tables indicate that it takes a four row, Freon coil, with a 45° Freon gas temperature to do the job. This coil gives a 60° dry bulb temperature of the air leaving the coil. Allowing for a 1 degree pick-up in the ductwork from the fan to the

#### BREAKDOWN ESTIMATE FOR A SMALL DRESS SHOP

1. 7½ HP Freon Condensing Unit.....	\$ 825.00
2. Direct Expansion Coils.....	181.50
3. Freon Specialties .....	45.00
4. Copper pipe valves, fittings.....	65.00
5. Galv. water pipe and fittings.....	12.00
6. Foundations and hangers.....	35.00
7. Fan (including motor-starter and drive)....	247.50
8. Solder, flux, pipe dope, etc.....	5.00
9. Filters and filter frames.....	28.00
10. Sheet Metal work.....	635.00
11. Grilles, registers, ceiling outlets.....	56.00
12. Automatic Control System.....	185.00
13. Cutting, patching, painting.....	25.00
14. Electric wiring .....	75.00
15. Pipe covering .....	225.00
16. Refrigerant charge—two 25-lb. drums Freon	25.00
17. Steamfitting labor—15 days.....	180.00
18. Social Security and Insurance.....	12.60
19. Incidentals, freight and drayage.....	25.00
	<hr/>
	\$2,887.60
15% overhead	433.14
	<hr/>
	\$3,320.74
10% profit	332.07
	<hr/>
	\$3,652.81
1% sales tax	36.52
	<hr/>
	\$3,689.33

outlets sets up the 19° diffusing temperature used in determining the quantity of air necessary to maintain the desired temperature in the dress shop.

With this coil information, the compressor is selected to balance the coil load, a 7½ HP compressor under the above operating conditions being satisfactory. In the same performance tables indicating the capacity of the compressor, we find a definite quantity of water at the available temperature. This quantity is used in sizing the water supply line to the condenser on the compressor. The water is discharged to the sewer.

A forward curved blade fan to handle 3,000 cfm against the static pressure of the system is then selected with a constant speed motor designed for ventilation duty and of horsepower sufficient to cover the maximum brake horsepower as indicated in the fan performance tables.

Local codes or ordinances might influence the above selections enough to change the entire layout and these have to be fully considered before making selections.





This women's dress shop was installed without an adequate outside air duct. The buyer's refusal to yield sufficient space for this duct has resulted in increasing his operating costs throughout the year.

## Sound Judgment is an Engineering Requisite

By Henriette T. Betlem

Betlem Heating Co., Rochester, N. Y.

WHEN the survey is completed, the next step is to convert the information acquired into a proposal and, in most cases, a set of blue prints for the sales presentation. Before this is done the equipment must be selected—the engineer's responsibility. His judgment determines the sizes, location, manner of installation of equipment and the sales price.

Seemingly, the most desirable quality an engineer can have is sound judgment. This seems to be something that is not acquired by study but is an innate sense of balance without which it is impossible to be of any great value as an engineer.

Your judgment should tell you when to select equipment which is barely large enough for the job or when to use the next larger size. Of course, several years of experience may compensate for lack of sense of balance and solve most of the problems. But, whether you gain your knowledge by experience or are fortunate enough to be born with good judgment, it is of utmost importance to make use of this asset in your office engineering.

To sell a job which will perform successfully,

it is essential that the heat gain be computed accurately and intelligently. The buyer will usually instruct you to figure for a peak load which will be the maximum number of people he has had in the establishment at one time. When computed on this basis the equipment required may be so large it will exceed the economical limits of the buyer's purse.

### Peak Load May Oversize Equipment

Experience quickly shows that cooling loads are calculated according to the type of establishment. Each should be approached from a different angle. The restaurant usually has a very high peak load of no more than a half hour duration. If the equipment were sized for this half hour alone, it would be much too large for the 23½ hours of average operation. It is entirely safe to assume the *average* capacity of the place during rush hours and base your calculations on that load. If the peak lasts from fifteen to thirty minutes there is sufficient reserve capacity in the equipment to carry over for that short time, providing the calculations as to lights, building gains, etc., are all correct.

### High Wattage Problems

A certain amount of reserve capacity can be obtained by pre-cooling; that is, bringing down the room temperature a few degrees below design conditions during off peaks so that the walls, floors and furniture will actually be cooler than the room at the beginning of the rush hour and be able to absorb some of the excess heat for a short time.

However, this application cannot be used in a jewelry store where the greatest source of heat is from the lights. There frequently is a wattage of 6 to 10 watts per square foot of floor space. When the installation is completed and the user finds how comfortably cool he is despite the heavy light load, he quite often changes the bulbs to the next larger size and then you find your equipment is no longer doing an effective job of cooling. It is wise, in calculating the load for this type of establishment, to assume no factor for storage and to be sure that the coil surface is large enough.

### Pre-Cooling Sometimes Desirable

In selling such a job the buyer should be urged to start up the equipment an hour or two before the lights are turned on. The combined load of bringing down the wall and fixture temperatures

from the outside conditions and removing the heat from the lights may be more than the equipment can handle on a peak day. If the internal load is not dissipated before the lights are all turned on it may be several hours before the room is cooled to design conditions.

If the sun load on the roof is a large proportion of the load, it is often desirable to spray the roof. This reduces the roof temperature almost to shade conditions. If roof sprays are not practical it is often possible to insulate the roof with rock wool and achieve almost the same results. This applies even if the design conditions are based on night temperatures as the effects of the sun on the roof are apparent until midnight.

### Storage vs. Coil Frosting

In using a storage factor to reduce the load, the engineer should always keep in mind the ratio of sensible to latent heat. If most of the sensible heat load is removed by pre-cooling, the equipment will have to operate at a very low refrigerant temperature to reach a dewpoint low enough to remove the required amount of moisture. The lower this temperature, the less capacity the refrigeration machine has and if this temperature drops much below the freezing point there will be constant trouble in coils frost-



Installations like this jewelry store have a tremendous light load in proportion to the total heat gain and usually require pre-cooling before the lights are turned on to bring the temperature down rapidly.



ing over. So, the heat removed by pre-cooling, should always be deducted from the sensible heat load. Then the ratio of sensible to latent heat should be calculated and if this gives you too low a refrigerant temperature, it would be wiser to neglect the storage factor entirely.

This suggestion is especially applicable in theatre cooling. The required dewpoint is already so low that even though the peak may be of short duration, the resulting loss in capacity of the refrigeration machine will more than offset any possible reduction in the total load.

#### Outside Air Volume

The outside air supply for cooling systems should have the same capacity as the total air supply for the conditioned space. This makes it possible to use outside air for cooling whenever the outside temperature is lower than the return air temperature. This makes possible a great saving in power costs. In only one instance we failed to install an outside air duct of 100 per cent capacity. The only available space to run the duct was through the storage cases for dresses in a women's dress shop. The buyer refused permission to install this duct so we had to reduce it to the bare requirements for adequate ventilation. This entire store is surrounded by warm areas, both winter and summer and as a result the refrigeration machine runs the year around. The internal load of lights and people is so great

that cooling is required on the second floor at all times.

Lack of proper zoning may not interfere with the sale of an air conditioning system, but it may cost you all the profit of the job *after* you have sold it. Any space, which is divided into sections which have varying requirements, should have zoning or else should be sold with the distinct understanding that uniform temperatures throughout the space should not be expected.

This becomes an acute problem when the requirements are reversed from winter to summer. If the equipment selection brings the price of the installation too high it may be better to sell the job on a lower degree of perfection. It may be simpler to have a service man change the settings of a few dampers three or four times per year than it is to install all the necessary controls and separate heating and cooling coils to obtain perfect results.

All these problems should be settled in the office when the equipment is selected for the job. If too much equipment is chosen the sale may be lost due to price. If equipment is inadequate to meet the guarantee conditions, the job may be sold, but it will prove to be a liability instead of an asset. Following an installation from its initial stage of being a prospect to the final one where it is turned over to the service man for maintenance, one can clearly see how important a part the engineer plays in producing profits for his organization.



This dress shop combined two houses into a single establishment, creating several divisions, each requiring varying amounts of cooling. Elaborate zoning with individual control would have placed the job beyond the economical limits of purchase, so desired conditions are maintained by hand dampers.

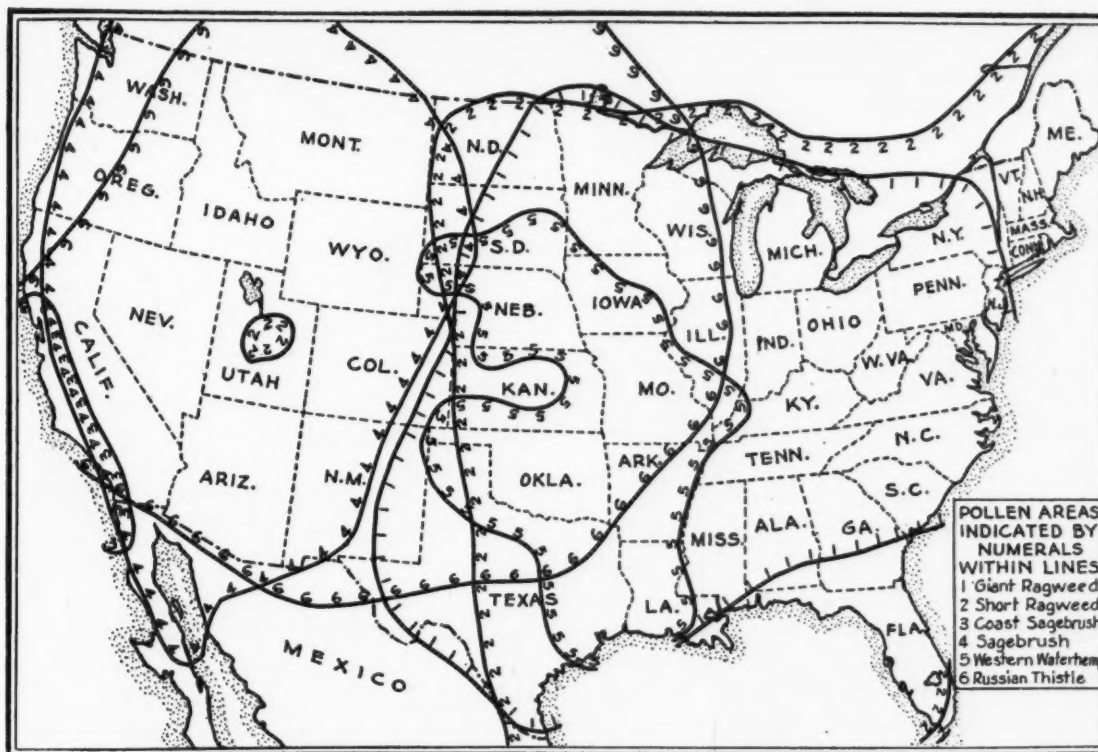


Fig. 3. Hayfever pollen areas for weeds in the United States, late summer and fall. Used by permission of Natural History Magazine and Dr. R. P. Wodehouse.

## Air Conditioning For the Relief of Cedar-Pollen Hayfever<sup>\*</sup>

By Alvin H. Willis and Howard E. Degler  
Research Assistant and Professor of Mechanical Engineering,  
The University of Texas, Austin, Texas

This University of Texas bulletin was written primarily for cedar pollen hayfever sufferers; however, the results obtained with \$100 air conditioning equipment can also be applied to hayfever caused by other pollen. Because the results are so straight forwardly explained and are so widely applicable, we republish the bulletin, with some minor deletions. About four chapters will appear. [Part I]

### I. Introduction

THERE are now, 1940, about four million people in the United States who suffer from hayfever for a period of from two weeks to five months out of every year, unless they are protected by clinical immunization. From year to year there has been and most likely will continue to be a slow but persistent increase to this number. It has been said that we are more enlightened now than we were twenty years ago and

that enlightenment leads to the proper diagnosis of more cases. Undoubtedly this is true, but it does not present the whole picture. The principal reason is that *the weeds from which hayfever pollen is derived are increasing in abundance*, with the result that the amount of pollen in the air is increasing, the number of those affected by it is increasing, and generally the severity of their affliction becomes greater year after year. Another contributing factor to the present day increased prevalence of hayfever is the changed living conditions of our people; fifty years ago agriculture provided a livelihood for most of our

<sup>\*</sup>Engineering Research Series No. 31, The University of Texas, Bureau of Engineering Research. Edited and reprinted by permission.



population and this healthful occupation seems to have immunized or built up a resistance in these people against hayfever. Today most of our population live in urban centers and the sedentary lives of many people makes them more susceptible to illness, particularly to hayfever, than their ancestors.

#### Object of Investigation

The present day prevalence of hayfever, as well as the ingenuity necessary to fight it, has aroused increased general interest. Quite naturally, this interest has turned to means for relieving and curing the hayfever sufferer. The medical profession has developed several methods of treatment, serum injections, nasal sprays, removable nasal filters, etc., but experience has shown that, in general, relief can be obtained most logically by removing the cause. With this thought in mind the air conditioning engineer has been coöperating with the physician. A number of hayfever (pollen and dust) patients, in spite of all therapeutic efforts, fail to obtain adequate relief from distressing symptoms. Many hayfever victims in the cedar-pollen area find it advisable to travel several hundred miles to get out of the pollen area and obtain relief for the week-end or a longer period. During recent years attempts have been made to help these patients by employing mechanical equipment intended to provide room-air free from pollen and dust in their normal environment, home, factory, or office.

The rapidly increasing number of persons afflicted with pollen (and dust) hayfever in this country has focused a good deal of interest on the further possibilities of mechanical air filters and electrostatic cleaners to insure improved health and increased efficiency of the American people, especially those who are gainfully employed. In some groups of workers the number of those susceptible to the cedar-pollen hayfever may be as high as 25 per cent. During the winter months (December to February) the pollen of the Texas cedars causes many cases of hayfever. It is the purpose of this article to acquaint its readers with the cedar-pollen hayfever problem, to discuss some of the work done along these lines, and to describe a simple low-cost air-conditioning unit that was developed to provide relief from cedar-pollen hayfever. The tests were conducted by the Bureau of Engineering Research at The University of Texas.

#### II. Weeds, Waste and Hayfever\*

Hayfever generally occurs in three seasons, according to the flowering of the three classes of

\*Material in this section taken from "Weeds, Waste, and Hayfever" by R. P. Wodehouse, *Natural History Magazine*, March, 1939. Used by permission of Dr. Wodehouse and *Natural History Magazine*.

plants that cause it. During the winter and early spring hayfever may be caused by trees, during the early summer by grasses, and in late-summer months by weeds.

#### Winter and Early-Spring Hayfever

One of the most important trees is the mountain cedar of Texas and Mexico, see area 1, Fig. 1. When it flowers, generally about Christmas time, it scatters great clouds of pollen, and sometimes the unsuspecting gather its greens for Christmas decorations. For this they are often rewarded with an attack of hayfever as the flowers, matured by the warm, dry air, fill the house with their pollen. In the early spring there are a few cases attributable to trees such as elms, oaks, birches, and poplars which flower very early, while still leafless. In the South and Southeast, see area 2, Fig. 1, where pecan trees are common their pollen claims more victims, as does that of the box elder in some cities of the Middle West and Rocky Mountain states.

#### Early Summer Hayfever

Virtually all the cases of early-summer hayfever in the Eastern states are due to the pollen



Fig. 1. Hayfever pollen areas for trees in the United States, winter and early spring. Used by permission of *Natural History Magazine* and Dr. R. P. Wodehouse.

of just five grasses: sweet vernal grass, June grass, orchard grass, timothy and red-top. In the South and West where the climate is too hot and dry for these grasses, their places are taken by Bermuda grass and Johnson grass, see Fig. 2. These grasses flower in the late spring and early summer, starting soon after the trees have finished, and give rise to the type of hayfever commonly called "rose cold."

It is astonishing that of the 1,100 or so different

kinds of grass which are native or naturalized in the United States only seven are responsible for any considerable amount of hayfever; none of these seven hayfever grasses is native to America. The pollen of any grass can be irritating to the hayfever patient, yet all other grasses are negligible compared with these seven leaders. This is true because the others do not produce enough pollen.

#### Late-Summer Hayfever

More than half of all the hayfever in the United States occurs in late summer and is caused by the short and giant ragweeds, sagebrush, and Russian thistle (tumbleweed); these pollen areas are shown in Fig. 3. The victims (nearly three million) of ragweed hayfever are more numerous than those from all other causes combined. In the Rocky Mountains and beyond, where the ragweeds are unimportant or absent, their place is taken by the sagebrushes, mugworts, and wormwoods, characteristic of the mountains, the Great Basin area, and the Pacific Coast, and by the salt bushes and oraches, characteristic of the Southwest; there are also other local plants too numerous to mention. Though all of these are native American plants, it is because of man's interference with nature's plan that they are growing in an unaccustomed abundance — hundred-inch plants at one-inch intervals.

Though the Russian thistle (tumbleweed) is

cause in the fall of the year the plants break off from their roots and are rolled along the ground, distributing their seeds as they go. It is estimated that a single plant produces 20,000 to 30,000 seeds.

#### Hayfever Due to Soil Abuses

There are other plants which contribute to the production of hayfever, but the seven grasses, the two ragweeds and the related false ragweed and bur ragweed, the sagebrushes, mugworts and wormwoods, and tumbleweed account for so much of it in North America that without them hayfever could be little more than a local phenomenon of academic interest. The seven grasses are useful agricultural plants when kept within bounds, causing most of their trouble when assuming the role of weeds. The others are ordinary weeds which, even apart from their hayfever proclivities, constitute a great national liability.

Hayfever is nature's reply to man's destructive and wasteful exploitation of natural resources just as much as is soil erosion, wind erosion, and floods. It is less spectacular than great gullies carved out of hillsides by running water, or the disastrous dust storms that move whole farms into the next state, or the floods that sweep away bridges. These are nature's answer in her boisterous mood; in her more subtle mood the answer is hayfever, and it comes so softly that few of us suspect that it is the answer to our thoughtlessness or greed.

#### Soil Recovery a Cure

Some ultimate causes of hayfever are: the destruction of the natural forest or cover of other vegetation, improper agriculture, the plowing of lands unsuited to agriculture and their subsequent abandonment, excessive grazing, and other processes destructive of our natural resources and often leading to soil erosion, but supposed to be inherent to progress in America. Truly hayfever is a man-made disease, the by-product of a shiftless and unorganized advance of civilization.

It has been said that only two types of landscape are tolerable, that left to itself and that brought completely under control. These are all we need for happiness. The correction of unecological misuses of the soil is strictly in accordance with the principles of land conservation, with the highest development of civilization, and with the greatest use of our continent. The best prevention of hayfever is to leave the land unmolested or to cultivate it properly and make it pay dividends. Anything between means "weeds, waste, and hayfever."

[Part 2 will follow]

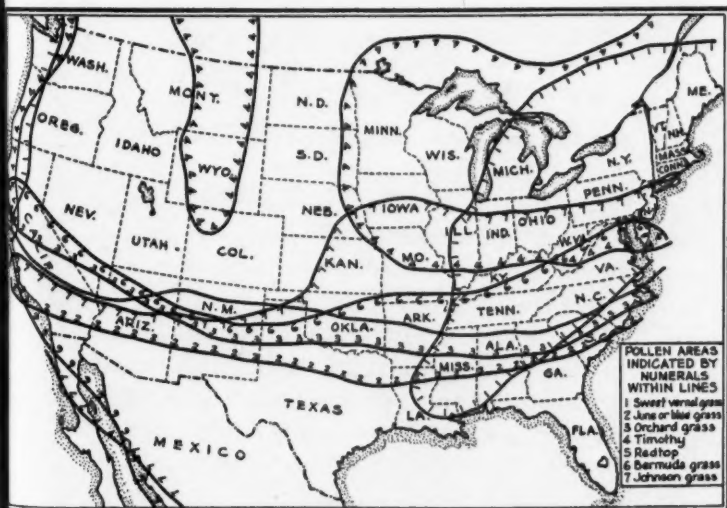


Fig. 2. Hayfever pollen area for grasses in the United States, summer. Used by permission of Natural History Magazine and Dr. R. P. Wodehouse.

less than a century old in America, it is a pernicious weed and among the most important causes of hayfever in West Texas, also throughout the plains and prairies from the Mississippi River westward almost to the Pacific Ocean. Not actually a thistle, it is so called from its spine-tipped leaves. It is also called tumbleweed be-



# Make Your Home Gloriously Cool with a **Coolair** TRADE MARK **ATTIC FAN**

THINK how much more fun you'd have this summer if your home were delightfully cool day and night! Invigorating coolness that helps you be a vivacious, well-poised hostess for afternoon entertaining . . . refreshing coolness that renews Dad's energy and pep when he comes home hot and tired from work . . . glorious coolness for gay summer evening parties and sound, untroubled sleep at night. All this luxury is yours at surprisingly low cost when you install a quiet, efficient Coolair fan in your attic. Turn the page to see how simple and inexpensive it is!

**MORE Pleasure** **BETTER Health** **GREATER Comfort**



## Blow Fan Exhaust Back Into House—

*is Harry Higgin's Plan for the Low Attic's Common to Florida Residences. He calls this idea "interior exhaust"*

which is hard to clean. Architects will not break roof lines except under severe pressure so we have had to devise new means of circulating air.

### Interior Exhaust Idea

**H**ARRY C. HIGGINS, cooling and ventilating contractor in Miami, Florida, finding himself faced with peculiar problems of attic fan installation, abandoned customary practices and developed application methods which may, eventually, be of far-reaching influence in other sections of the country.

The chief problem was found in house construction. In Mr. Higgins' area, low pitched roofs and Mediterranean architecture leave no head room in the attic for an upright fan. The architects who design these houses do not want the roof lines broken by dormers; further the gable is usually not high enough to locate an exhaust grille. Eaves and porches generally are not constructed or attached so that exhaust can be through horizontal louvres.

Explains Mr. Higgins—"We have had to discontinue almost entirely the principle of exhaust to the outdoors from the fan. We do not have and cannot get high gables or dormers and owners complain about dirty louvre screening

"Our method is based upon 'interior exhaust.' We lay our fan down over a stair or grille opening in the central hall. The air from the fan, instead of being blown outdoors, is blown into other rooms of the house through ceiling register so that in effect we pull air to the fan from some rooms and exhaust air from the fan through other rooms. In one story houses, as an example, we place our fan horizontally in the attic above an 85 per cent free opening wood grille. We place metal grilles in the center of all bedrooms. The air from the living room, kitchen, dining room and hall is pulled into the fan. Leaving the fan the air enters the small attic and being under pressure passes down into the bedrooms through the grilles and on outdoors through bed room windows.

"Many people think that this method of blowing attic air down into the house means high bedroom temperatures, but our attics seldom have a cubage above 2,000 to 3,000 feet and a fan will blow this volume of air out of the attic in a few seconds. In most of our installations this attic



volume is blown out in 5 to 10 seconds. The air passes through the attic so fast that it cannot and does not pick up heat.

"We have found that blowing air into bedrooms from the attic at register velocities of about 750 feet per minute has just as much cooling effect as sucking air in through the windows. Meanwhile we are also keeping the attic temperature down to house temperature.

#### Engineering Fundamentals

"Sound and adequate engineering is very much a part of our service. Openings in the ceiling leading to the fan and openings from the fan to bedrooms are sized for 125 per cent of the fan capacity. The air blown into the attic sets up a turbulence which removes every bit of attic air and the same turbulence of large volumes of air at high velocity through the rooms cleans out all hot air in a thorough manner. This system, inci-

dentally, eliminates all need for a separate kitchen exhaust as the kitchen air is removed whether the kitchen is on the suction or pressure side of the fan.

#### Fans Can Be Reversed

"We always connect up our systems with a reversible control so that if the air flow into the bedrooms is too harsh the owner can reverse the fan and put the bedrooms on the suction side of the fan. In operation we tell the owners that the doors to rooms with grilles must be closed when the fan is running, otherwise the house is not divided into two parts as planned. It should be very evident that this scheme is extremely flexible in so far as placing rooms on the suction or pressure side of the fan goes and we can really do tricks with our system.

#### Full Capacity Stressed

"This attic fan or ventilating business has been no bed of roses. Selling has been hard work. In spite of owners being air conditioning minded or comfort minded even the simplest fan system costs money and many cannot spare the cash. Air cooling in our area is far ahead of refrigeration for residences when initial costs, operating costs and comfort obtained are balanced against the owner's ability to buy.

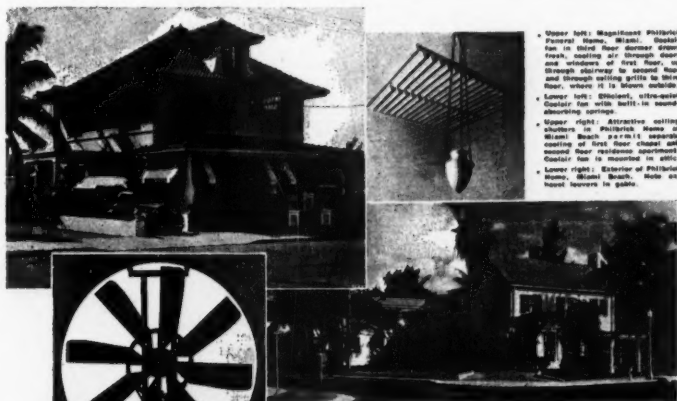
"We have done what we think is a fairly good job of selling attic fans. Perhaps we have not sold as many fans as some others, but the fans we have sold have each made a profit and every one of our customers is a booster and a recommendation. Attic fans are accepted in our area; everyone thinks them fine, but many think the cost is too high. We regret that many people buy half as much system as they need for one-half the cost they should pay and receive practically nothing in the way of benefit."

#### Sales Methods Not New

Contractor Higgins has found no new ways to get business. As a matter of fact, his business getting methods are extremely simple and conservative and have been used by many contractors everywhere. Sales are attempted in several fields, from houses to laundries and airplane hangars, but houses predominate.

Prospects are obtained by following building reports, through calls on architects and from customer recommendations to friends. A method has been devised to circularize owner, architect or builder when a building report is issued, but salesmen must call on the owner, builder or architect after each job is started if Higgins' equipment is not specified.

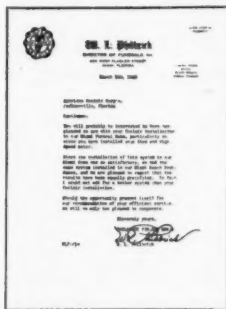
This year, for the first time, direct mail is being



Upper left: Magnificent Philbrick Funeral Home, Miami. Coolair fan in third floor dormer draws fresh cooling air through doors and windows of first floor, up through chimney to second floor and through ceiling grille to third floor, where it is blown outside.  
Upper right: Efficient, ultra-quiet Coolair fan unit built in sound-absorbing springs.  
Lower left: Attractive ceiling shutters in Philbrick Home at Miami Beach permit venting cooling of first floor chapel and second floor residence apartment. Coolair fan is mounted in attic.  
Lower right: Exterior of Philbrick Home, Miami Beach. Note exhaust openings in gable.

## COOLAIR Breeze Conditioning

... Means Finer Funeral Service in South Florida, Too



Late last summer W. L. Philbrick, Director of Funerals, Inc., of Miami, had Coolair engineers install a 4 1/2-foot Coolair fan in their Miami Home to cool and ventilate the entire building.

This installation proved so satisfactory that a few months later, Mr. Philbrick had a similar fan installed in their Miami Beach Home. The results of these two Coolair installations are indicated in Mr. Philbrick's letter reproduced here.

Leading funeral directors throughout the country are turning to Coolair for quieter, more efficient cooling and ventilation. They are realizing more and more that a scientifically planned cooling and ventilating system is essential to finer funeral service.

The ultra-quiet Coolair fan, mounted out of sight and hearing in an outside wall, roof penthouse or attic space, exhausts the hot, stagnant air and draws in tremendous volumes of gently moving, fresh, outside air, cooling all or any part of your building. No costly refrigeration equipment, no drafts, no noise. Just a constant circulation of refreshing, cooling air that BREEZE-CONDITIONS your building for genuine comfort during the hottest weather.

Hot summer weather is almost here. Join up now with these progressive funeral directors from coast to coast who are offering finer funeral service with Coolair breeze-conditioning. Write today for details on how little it costs. No obligation, of course.



**AMERICAN COOLAIR CORPORATION**  
Manufacturers . . . . . JACKSONVILLE, FLORIDA

Reprinted from the April 1940 issue of THE SOUTHERN FUNERAL DIRECTOR

Contractor Higgins uses manufacturers' literature in his direct mail work. The three pieces shown are being used this year. Particular attention is being paid to hotels, apartments, mortuaries, etc.

sent to certain classifications of prospects like apartment and hotel owners, but results are as yet undetermined. Last year several interesting installations were made in apartments and hotels—these installations paid for themselves many times over in the one season—and, as a result, this field is being prospected this year.

Radio and newspaper advertising have not been used by this contractor. Others in Miami have used both, but the net results have not seemed attractive to contractor Higgins. Salesmen are paid on a commission basis. Untrained individuals, obtained through classified advertising, have not proved suitable so all present salesmen have been taken from within the trade.

#### Scheme Requires Sound Engineering

As stated, much emphasis is laid on proper engineering of each job. Satisfied customers have been the biggest aid to sales so far and satisfied customers are assured, Mr. Higgins finds, when the installation does exactly what the salesman promised. Particular sales effort is directed to getting the prospect to buy an oversized fan. "Fans installed horizontally, directly over the grille, as ours are," says Mr. Higgins, "must be quiet. An overcapacity fan costs no more than an additional 10 per cent. If the additional 10 per cent cost spoils the sale, we prefer to lose the job to having a job which is a constant source of complaint. Sold as we recommend, we can always slow the fan down and decrease any noise.

"Our method of dividing a house into two units, pulling air out of one unit and blowing air into the other unit means that we can use a fan approximately one-half the size required when air is pulled from the whole house. And we still give the same number of air changes and move the air at the same speeds through the rooms. Of course this method requires a fan constructed to run horizontally. Our fans have end thrust bearings (American Coolair); so have the motors used. Many of our jobs have been in operation for three years and have never been oiled or greased.

#### Advantages of Inside Exhaust

"We cannot understand why this idea has not become popular in other sections of the country. We even use it in houses where there is plenty of head room because we find the system works just as satisfactorily as the all-house intake. The advantages we believe, are:

"1. It overcomes the objections of architects to the use of penthouses, dormers, etc., which ruin the roof lines, particularly where hip roofs are the vogue.

"2. A smaller unit can be used on the same sized house, with better results, as the fan size is

based on cubical contents of about half the house, for a  $\frac{3}{4}$ -minute air change.

"3. The installation cost is less, for the grilles cost less than building a penthouse.

"4. There are no openings to the outside to admit cold air into the house in winter. The grilles are closed and the attic is tight.

"5. It eliminates screening the usual exhaust opening, which clogs up frequently with lint and requires cleaning to bring the system up to proper efficiency. If automatic louvers are used instead of screened exterior openings these are continually flapping and making a racket in 'squally' weather, which trouble it eliminates.

"6. It gives entire privacy in all bedrooms as these doors are kept closed during operation. Exhausting through windows deposits some lint, but the lint is more evenly distributed and screens are readily accessible for cleaning.

"7. It eliminates need for a kitchen fan in a bungalow, and keeps the kitchen much cooler than any kitchen unit we ever sold.

"8. It adapts itself better to our normal living habits. Here we live an outdoor life in summer, with all windows open in all parts of the house. With the old system one had to be opening and

(Continued on page 113)

### Here's **PROOF** that a **COOLAIR FAN** Can Make Money for You This Summer



This Coolair Installation  
Paid for Itself . . . . .  
and Produced a Profit  
. . . In One Summer!

In July of last year the popular Marine Terrace Hotel of Miami Beach, Florida, after considerable study of cooling systems, had Coolair engineers install three 5-foot fans to ventilate and cool the western half of two floors and the dining room and kitchen on the ground floor.

Now Mr. John B. Reid, managing director, writes us in part:

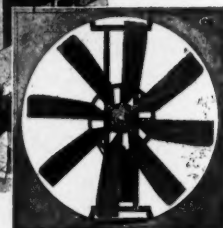
"We found that we could reduce our room temperature by approximately 12 degrees through the portion of our building that was not even rentable except during the winter months and these rooms that were otherwise useless, commenced to bring in a revenue and had more continuous occupancy than any other portion of our building . . .

"No matter how quiet the day might be, you could always feel the fresh flow of air as the exhaust fans were continually replacing the old air with the fresh, cool air. These rooms were desirable during the very hottest period of our summer season . . .

"We figure that we have more than paid for the expense of installing and in addition have shown a fair sized profit on one summer season."

The system has proved so profitable that Mr. Reid plans to have more fans installed to cool a recent addition to the building.

Artist's drawing of the Marine Terrace Hotel, Miami Beach, Fla., showing recently completed addition of last. Two Coolair fans in roof penthouses (not shown in drawing) cool half of the main building. A third fan cools dining room and kitchen on ground floor.



The efficient, ultra-quiet Coolair fan with patented sound-absorbing springs.

Here is a Coolair success story that is being duplicated, with variations, by smart hotelmen from coast to coast. And there's a good, sound reason for it . . .

**THE COOLAIR FAN DOES AN EFFECTIVE COOLING JOB MORE EFFICIENTLY AND MORE ECONOMICALLY THAN ANY SIMILAR SYSTEM YOU CAN BUY!**

Mounted in a roof penthouse, window, outside wall or partition, the ultra-quiet Coolair fan exhausts hot, stale air and brings in tremendous volumes of fresh cooling, outside air through doors and windows. We costly refrigeration equipment, no drafts and no re-circulation of dead, de-vitalized air. Guests prefer the Coolair system because every breath of air is fresh, life-giving, just as nature created it.

Decide right now to make more money this summer. Keep those top floor rooms rented . . . heat rates and profits in your dining room or coffee shop . . . by **SHUTTING DOWN** them with Coolair. Write us wire today for more information. Let us have our representative make a cost estimate. No obligation, of course.

Coolair fans are made in 18 sizes ranging up to nine feet in diameter to meet the ventilating and cooling requirements of kitchens, laundries, coffee shops and even entire buildings. They're sold by Coolair dealers and installed under the close supervision of trained field engineers. Each job is carefully and individually planned for maximum efficiency and economy.



View of third floor hall with grill in ceiling. "Calle screen" partition across corridor restricts air movement to western half of floor. Cooling outside air is drawn through windows and lowered down, and up through grill where fan blows it outside again.



**AMERICAN COOLAIR CORPORATION**  
Manufacturers . . . . . JACKSONVILLE, FLORIDA

AMERICAN ARTISAN, JUNE, 1940  
RESIDENTIAL AIR CONDITIONING SECTION





## Pattern Development for

# Air Conditioning Fittings\*

By William Neubecker

Head Instructor

Sheet Metal Department, New York Trade School

## Double Curved Transition Offset

**F**IGS. 43 to 45, inclusive, show the methods of laying out double curved offsets, regardless of whether the offset connects from rectangular to rectangular or rectangular to square ducts. In the development of the patterns, care must be taken so that the full area is maintained from inlet to outlet. The parallel line method will be used in developing the pattern shapes.

### Offset Rectangular to Rectangular

Fig. 42 shows a perspective view of the problem to be solved. Note that both rectangles at top and bottom are of similar dimensions but in a reversed position. The upper opening lies in a horizontal plane and the lower opening in a vertical plane.

The first step is to draw the elevation and plan in Fig. 43 in its proper relative position as follows: Draw any horizontal line as  $A-a$  in elevation and using  $A$  as center, with the required throat radius  $A-1$ , draw the quadrant  $1-4$ . Extend the line  $A-4$  and make  $4-4^\circ$  equal to the wide side of the rectangle. With  $A$  as center and  $A-4^\circ$  as radius, draw the heel  $4^\circ-a$ . At a sufficient distance below the elevation, draw any horizontal line as  $5^\circ-B$ .

From points  $1$  and  $4$  in elevation drop perpendicular lines to intersect the line  $5^\circ-B$  at  $B$  and  $4^\circ$ , respectively. With  $B$  as center and  $B-4$  as radius, draw the quadrant  $4^\circ-1^\circ$  intersecting the perpendicular line  $1-B$  at  $1^\circ$ . Make the distance  $1^\circ-1^\circ$  equal to the narrow side of the rectangle and, using  $B$  as center and  $B-1^\circ$  as radius, draw the quadrant  $1^\circ-5^\circ$ , complete the rectangle  $1^\circ-a^\circ-4^\circ-5^\circ$  in plan as shown, also the rectangle in elevation shown by  $4-5^\circ-4^\circ$ , both having similar dimensions, but in reverse positions.

This completes the plan and elevation in which quadrants or quarter circles have been used.

\*All rights reserved.

Should it become necessary to have the curves in plan or elevation irregular or elliptical in shape, the same principles would be used in developing the pattern shapes.

Now divide the top of the offset  $1-4$  in elevation into equal divisions as shown by the small figures  $1, 2, 3$  and  $4$  (being careful to use more divisions in practical work), from which points drop perpendicular lines or lines drawn at right angles to  $A-a$ , to intersect the heel in elevation from  $1^\circ$  to  $4^\circ$ ; the heel in plan from  $1^\circ$  to  $4^\circ$  and the throat in plan from  $1^\circ$  to  $4^\circ$ . Establish an extra point in the heel in elevation between  $a$  and  $1^\circ$  as at  $b$ , from which point drop a perpendicular line to intersect the rectangular in plan at  $b^\circ$  and  $b^\circ$ .

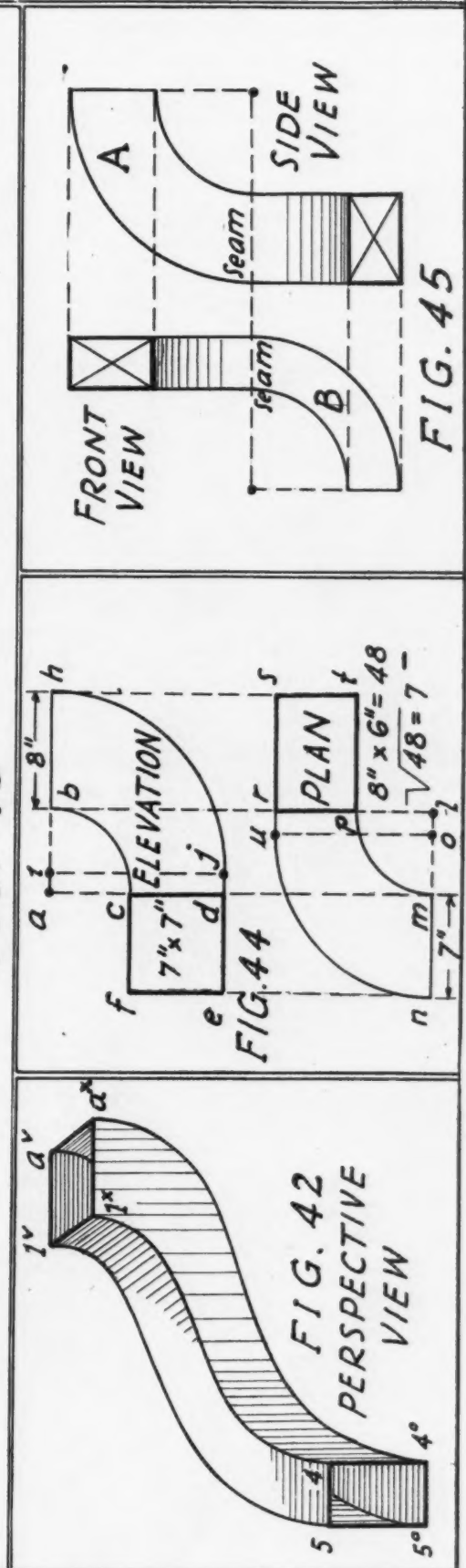
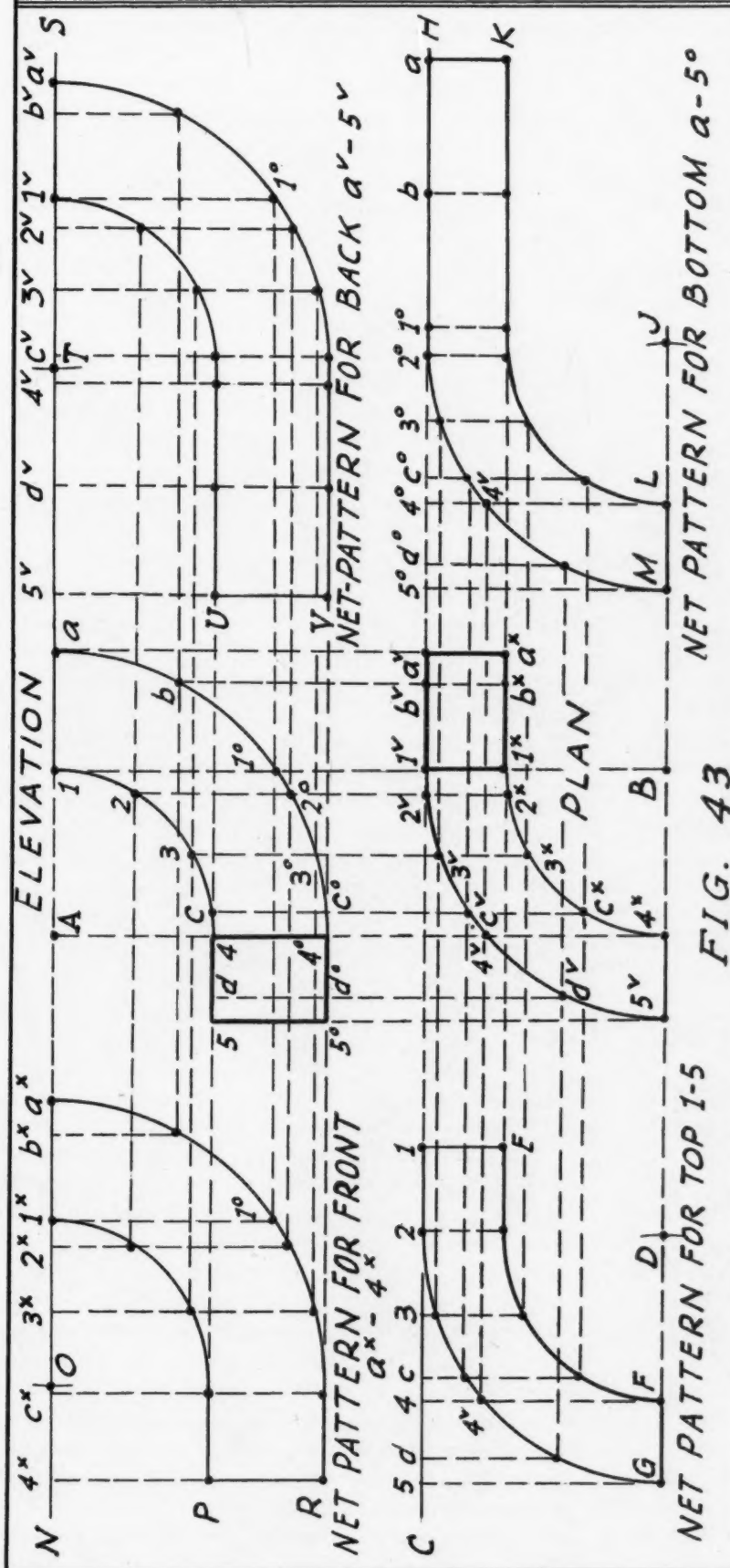
As the space in the throat in plan between  $3^\circ$  and  $4^\circ$  is too great, establish an extra point as  $C^\circ$ , from which erect the perpendicular line to intersect the heel in plan at  $C^\circ$  and the heel and throat in elevation at  $C^\circ$  and  $C$ , respectively. As the space between  $4^\circ$  and  $5^\circ$  in plan is also too great, establish an extra point as  $d^\circ$ , from which erect the perpendicular line to intersect the rectangle in elevation at  $d^\circ$  and  $d$ .

### Developing the Patterns

Having spaced all four curves in both plan and elevation, the patterns may now be developed. Extend the line  $A-a$  in elevation right and left as shown by  $N-S$ . Also extend the line  $1^\circ-a^\circ$  in plan likewise as shown by the line  $C-H$ . Starting with the top pattern, take the girth from  $1$  to  $5$  in elevation and set it off on the line  $C-H$  as shown by similar letters and numbers  $1$  to  $5$ . From these small figures drop perpendicular lines indefinitely and intersect them by horizontal lines, drawn from similar numbered and lettered points on the curves in plan, resulting in the points of intersections shown in the pattern for top.

As the space  $4-5$  in elevation lies in a horizontal plane, the pattern shape for that space

PATTERNS - FOR-DOUBLE-CURVED-TRANSITION  
OFFSET-FOR-RECTANGULAR-DUCT-HAVING  
EQUAL-AREA-THROUGH-OUT



would be a reproduction of the segment  $4-5^v-4^x$  in plan. To reproduce this segment in the pattern for top, take the radius  $B-5^v$  in plan and set it off from  $G$  in the top pattern and obtain intersection  $D$ . With  $D$  as center and  $D-G$  as radius, describe the arc  $G-4^v$ . Through points of intersections previously obtained trace the curves  $4^v-1$  and  $E-F$ . Then will  $1-E-F-G-1$  be the net pattern shape for top  $1-5$  in elevation.

For the bottom pattern, take the girth from  $A$  to  $5^\circ$  in elevation and set it off on the line  $C-H$  as shown by similar letters and numbers  $A$  to  $5^\circ$ . From these points drop perpendicular lines and intersect them by horizontal lines drawn from similar letters and numbers on the two curves in plan, resulting in the points of intersections shown in the pattern for bottom. Again take the radius  $B-5^v$  in plan and set it off in the pattern for bottom from  $M$  to  $J$ . With  $J$  as center and  $J-M$  as radius, describe the arc  $M-4^v$ , a reproduction of  $5^v-4^v$  in plan. Trace lines through points previously obtained in bottom pattern as shown. Then will  $a-K-L-M-a$  be the net pattern for bottom  $a-5^\circ$  in elevation.

#### Front and Back Patterns

For the pattern for the front  $a^x-4^x$  in plan, take this girth and set it off on the line  $N-S$  at the top as shown from  $a^x$  to  $4^x$ . From these small letters and figures drop perpendicular lines and intersect them by horizontal lines drawn from similar letters and figures in the two curves in elevation. As the space  $1^x-a^x$  in plan lies in a horizontal plane, the pattern for this space will be a reproduction of the segment shown by  $1-1^\circ-a$  in elevation.

To reproduce this segment in the pattern for front, take the radius  $A-a$  in elevation and set it off in the front pattern from  $a^x$  to  $O$ . With  $O$  as center and  $O-a^x$  as radius draw the arc  $a^x-1^\circ$ . Now trace lines through points previously obtained in the front pattern as shown. Then will  $1^x-P-R-a^x-1^x$  be the net pattern shape for front shown by  $A^x-4^x$  in plan.

The pattern for the back is laid out in a similar manner. Take the girth from  $a^v$  to  $5^v$  in plan and set it off on the line  $N-S$  at the top as shown by similar letters and numbers  $a^v$  to  $5^v$ . From these points drop perpendicular lines indefinitely and intersect them by horizontal lines drawn from similar letters and figures in the two curves in elevation.

Reproduce the segment  $1-1^\circ-a$  in elevation to the pattern for back, by taking the radius  $A-a$  in elevation and setting it off in the back pattern from  $a^v$  to  $T$ . With  $T$  as center and  $T-a^v$  as radius, draw the arc  $a^v-1^\circ$ . Trace lines through intersection previously obtained, then will  $1^v-U-V-a^v-1^v$

be the net pattern for back shown in plan from  $a^v$  to  $5^v$ .

As all four patterns are net allowance must be made for laps or edges for either double seaming, riveting or soldering.

#### Rolling and Assembling Patterns

Care must be taken when rolling the pattern shapes. The patterns for the top and bottom must be run through the rollers or formers by having the end  $1-E$  of the top pattern and  $a-K$  of the bottom pattern, parallel with the line of the rollers and then pass them through to the required curve to fit the front and back patterns. The same procedure applies to the front and back patterns. The line  $1^x-a^x$  of the front pattern and the line  $1^v-a^v$  of the back pattern must also be placed parallel to the rolls and then passed through the rolls to fit the curvatures in the top and bottom patterns. By referring to the perspective in Fig. 42, note that numbers and letters at the top and bottom, correspond to similar numbers and letters in plan and elevation respectively in Fig. 43.

#### Offset Rectangular to Square

It is sometimes necessary to fabricate a double curved transition from square to rectangular of similar area as shown in Fig. 44. Here is an example when one end is 6x8 inches and the other end must be square of similar area. The dimension of the square end is computed as follows:

$$6 \times 8 = 48. \quad \sqrt{48} = 7. \quad 7 \times 7 = 49.$$

Knowing the dimensions at top and bottom of the offset, the plan and elevation are drafted so as to give graceful sweeps and maintain the area throughout, as follows: Let  $a-b$  represent the radius for the throat in elevation, with which draw the quadrant  $b-c$ . Make  $c-d$  7 inches, and complete the square  $d-e-f-c$ . Make  $b-h$  8 inches. Take the *least* distance in the offset, which would be  $d-a$  and set it off from  $h$  to  $i$ . Use  $i$  as center and draw the quadrant  $h-j$  to meet the perpendicular line dropped from  $i$ , at  $j$ . Draw the  $j$  to  $d$ , which completes the elevation.

From  $b-c$  and  $f$  in elevation drop perpendicular lines to meet the lower horizontal line (drawn at pleasure) at  $l-m$  and  $n$ , respectively. Use  $l$  as center and draw the quadrant  $m-p$ .

From  $p$  construct the rectangle  $p-r-s-t$  8x6 inches. Take the *least* distance, as  $l-r$  and set it off from  $n$  to  $o$ . Use  $o$  as center, with  $o-n$  as radius, draw the quadrant  $n-u$  to meet the line erected from  $o$  at  $u$ . Draw a line from  $u$  to  $r$  to complete the plan. Having drawn the plan and elevation in its proper relative position, the patterns are developed the same as was described in connection with Fig. 43.

Where space is unlimited, double curved offsets

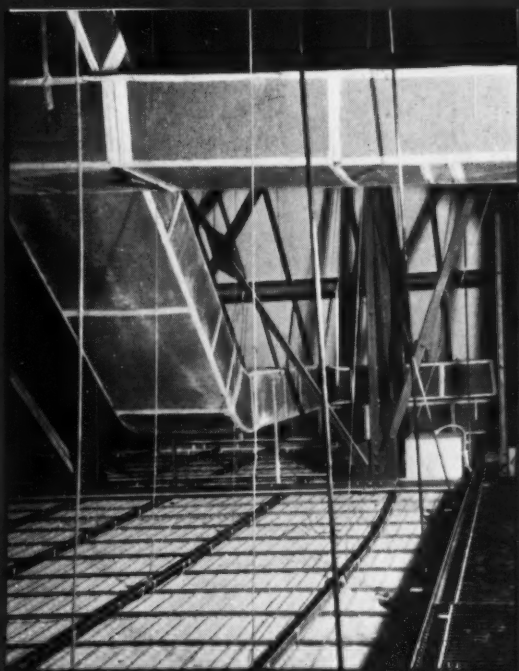
(Continued on page 118)



AMERICAN ARTISAN

# SHEET METAL

S E C T I O N



DEVOTED TO SHEET METAL CONTRACTING AND FABRICATING



## **BIG JOBS.. a BIG NAME**

There is a name known everywhere among sheet metal men for the quality it implies. That name is SUPERIOR. For many years Superior Steel Sheets have been a favorite among sheet metal workers because of their fine workability and uniform clean appearance. If you want a sheet that's soft annealed, flat and level, superior coated and uniform throughout, specify SUPERIOR.

**THE SUPERIOR SHEET STEEL CO.**  
Canton, Ohio

Division of Continental Steel Corp., Kokomo, Ind.

# **SUPERIOR**

OPEN HEARTH STEEL SHEETS





Aluminum, fabricated by hand craftsmen of Hollywood Metal Products, provide armor for "Reel Business." Body armor, leg armor, even the helmets of this picture were made by this shop.

## "Reel Business" and Other Metal Specialties

By A. B. Laing

Hollywood, Calif.

**W**HEN the virgin Queen Elizabeth discarded a lover, he was ordered to don armor of silver and gold—to distinguish him from the favorite of the moment who, sported black and gold. Such royal whims, figuring in a recent screenplay, result in some odd contracts for the Hollywood Metal Products.

As this company's name implies, it makes up a large number of the metal props and set dressings used in moving pictures.

Breast plates, cutlasses, greaves and other leg armor and visored helmets fabricated for the "Life and Loves of Elizabeth" were done in alu-

minum, mostly. Burnished, the natural color of the metal closely resembles silver on movie film. The same material was japanned for the black trim of Errol Flynn's harness and gilt surfaces were actually gold plated, brass fittings being added.

The shop once duplicated Palomar Observatory in miniature with "practical" moving parts. A 720-foot ocean liner was rendered in galvanized iron, reduced to a length of 16 feet. The model, made to float in a tank before the cameras, weighed 3,000 lbs. and sold for around \$1,000. Where the ship from which it was copied was





Left to right—A recent window display of picture “props” made of several metals. Some props have been so realistic that the censors banned the instruments of torture from a picture. Center—Housekeepers “planning” desk (all metal) is a fast seller. Right—Owner Vondenbush’s private office displays a few of the choicest specialty items.

provided with a passenger handrail of 3-inch pipe, the metal artisans used  $\frac{1}{8}$ -inch welding rod to obtain the exact scaled dimensions.

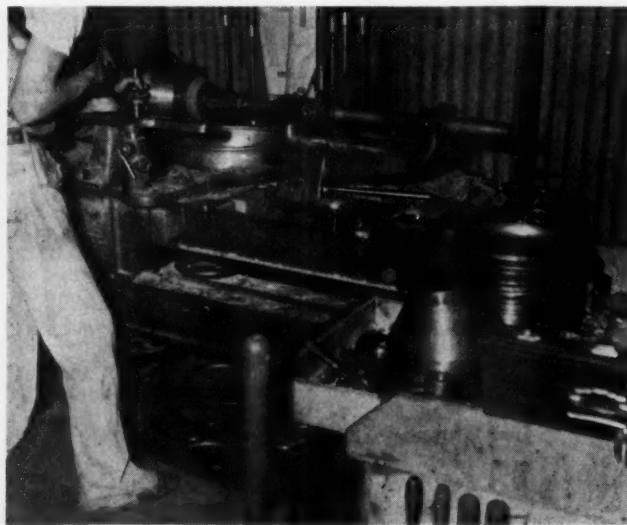
A 5-foot “Golden Calf” for a biblical piece was hammered from copper. Some elaborate candelabra were similarly turned up in copper, which was then silver-plated. When buffed up, the massive ornament was fit to grace the shelves of any jeweler’s, although Hollywood Metal Products contracted the job at a comparatively modest sum.

F. J. Vondenbush, owner and manager of this versatile plant, admits that there’s a fair profit in silver and gold. But metal prop-building is exacting work, he explains.

“So many last-minute changes in the scenario

—which involve corresponding quick changes in the materials and items specified plus sudden demands for overtime—call for workmen of a peculiar temperament. To scrap a beautiful art object, at the very moment of imparting the final touches, is heartbreaking to the craftsman who takes pride in his work.

Of much interest recently are some cruel instruments of medieval torture which the censor deleted from a film and used by the shop for window dressing items. These phoney relics and bits of ancient armor really slowed down traffic past the building. And owner Vondenbush has erected a particularly attractive monel trimmed front for exhibiting shop samples.



A stamping press forms many of the parts used. Here the side of a chart cabinet is being formed and die cut in one operation. Right—Spinning plays a highly important role in the production of many items. Stock dies are prepared for standard items—one time orders are spun from temporary dies



Left to right—Wherever possible, spot welding is used to join pieces. Workmen are skilled in welding practically all materials. Center—Testing of finished products before painting is a standard procedure. Right—Small items are spray painted on the drying racks.

One such display included a bright monel heater, grilles, old-time torch-holders (flambeaux) and a japanned machine gun of light galvanized iron. These exotics impressed the public with the versatility of present-day metal working machines and finishes. Plenty of folks stopped and entered to query the assistants about the goods on display.

Hollywood Metal Products makes a specialty of hard-to-do jobs—which may be partly responsible for their success under stiffly competitive conditions. One example of this care and experience in manufacture is the brass trophy cup which reposes in Mr. Vondenbush's modernistic and metal trimmed office. It has already been awarded no less than six prizes in contests sponsored by local jobbers and metal wholesalers' association.

Quite in contrast was a contract for aluminum airplane cowlings (see stack of chuck blocks, page 60 for spinning cowlings up to 72 inches in diameter).

All metal kitchens are featured. The firm claims to be the first installers of steel walled kitchens. They put one stainless steel kitchen in a famous actress' home years ago, and recently ripped out all the tile in a movie star's home to substitute gleaming steel. As this matinee idol said, the cost of the rare china which housemaids smashed on the old stone-like drainboards was sufficient to panel every room in his house with stainless steel.

The photographs show several items which have been successful. Mr. Vondenbush is seen

rolling out one of the popular steel household units his firm promotes. "Termit, fire and germ-proof" are the canvassing arguments that bring orders to this department of the business. The piece shown is a "Planning Desk," a home chef's corner office with space for the phone and files of recipes. The stainless counter top and roller drawers are features.

Says Mr. Vondenbush: "On specialty articles, we offer manufacturing facilities to sponsors of new devices—up to a certain point. While the market is being tested on the new commodity, we can efficiently turn out stocks on a limited-production basis. We cannot do mass production, so when any item attains nationwide demand and distribution, manufacture must be taken elsewhere. In this way we have been the springboard for many new manufacturers.

The shop believes in using lavishly in its own offices the materials it recommends to its customers. On the way out you pass bright steel trimmed counters where racks are laden with advertising matter for furnaces, centrifugal pumps, domestic water and power systems, ornamental radiators, grilles and other items likely to interest waiting customers.

Beyond is the manager's private office smartly lined with polished wood and metal and hung with stainless rapiers, embossed copper shields and other sheet metal masterpieces. But this luxurious office is generally uninhabited, for when not checking on production progress, Mr. Vondenbush is out—signing new business for his hustling shop.





Trinity Church, New York City, has a 90-year old copper roof which shows no flaws. Proper anchorage and proper application, create long life in a copper roof.

THERE have been several instances lately where materials other than copper have been chosen for the roofing of important buildings, for the alleged reason that the former copper roofs on these buildings "failed." Some persons have gained the impression that copper can no longer be considered a satisfactory roofing material under modern conditions and that if a roof is to last for a long time, with a minimum of maintenance or upkeep expense, other materials must be used. This is a rather serious indictment of a roofing material that is known to have given centuries of satisfactory service in many very important applications. It certainly raises the very important question "WHY?" Why, if these older installations have lasted for centuries, have some of our modern ones "failed" in a comparatively short time?

#### What Causes Roof Failures?

It therefore behooves us to look carefully into the situation to search for the answer to this question. Is it because (1) a purer grade of copper (i.e., electrolytic) is now used instead of copper produced under the older methods? (2) or that the atmosphere is more contaminated in our mod-

# *Anchorage—*

## Requisite No. 1 For Long-lived Copper Roofing

By Carter S. Cole

Engineer, Copper & Brass Research Ass'n

There seems to be some feeling that copper—as a material—is not as long-lived as we formerly thought. Such is not the case. The trouble is contractors are not laying copper roofs correctly. The failures we hear about can all be traced to faulty application. So American Artisan begins here a series of articles by an author widely known in this field. In these articles the common application faults will be analyzed in detail and the remedies pointed out.

ern cities? (3) or is it due to some other cause which can be ascertained and so provided for, or avoided?

As to the first question, careful consideration of all the factors involved and examination of many installations still gives no direct answer. There is no conclusive evidence that any kind or type of copper will give a different kind of service than another kind of copper. The answer to our question is not to be found here.

As to the second question, there is no doubt that our atmosphere today is more polluted than it was in the past. Therefore, copper roofs are exposed to severer chemical attack than formerly. But even so, the trouble experienced from this cause is a very minor matter compared to other considerations. The patina which forms on copper is a protective coating furnished by Nature. When it has once formed, any chemical action by corroding gases in the atmosphere is negligible.

This brings us to a point overlooked by most contractors. It is—we must recognize the fact

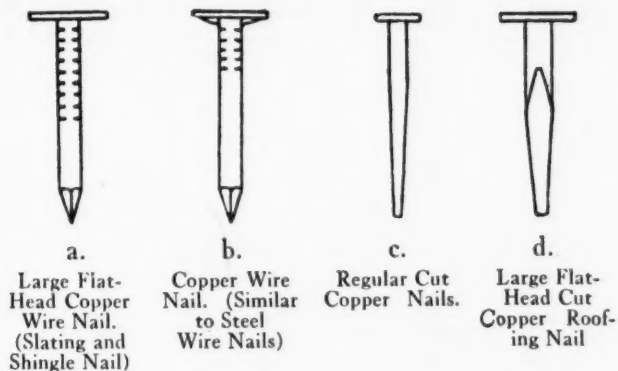


Fig. 2.—Forms of copper roofing nails considered suitable for proper application. Nails of materials other than copper should not be used with copper sheets.

that the formation of patina on copper will be inhibited by the run-off from a skylight. Further, if the skylight bars or other fittings of the skylight assembly are of ferrous material, improperly protected from atmospheric attack, the resulting corrosion products of the iron will tend to attack the copper. If, however, the skylight construction is entirely non-ferrous, although the formation of patina may be inhibited, active corrosion of the copper will not ensue.

#### Improper Application Causes Failure

What, then, has been the main cause for the

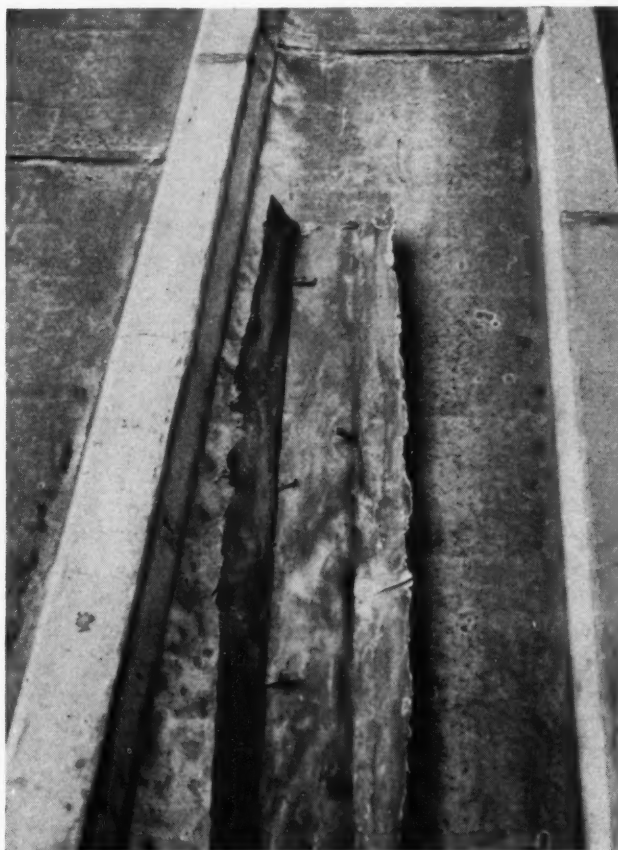


Fig. 3.—A combination of too-small cleats, one nail (ferrous) which rusted, caused this copper roof to "fail" although the copper was still good for generations.

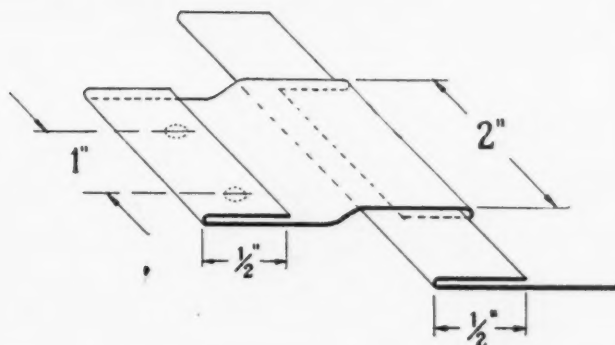


Fig. 1.—A cleat of large enough size, held by at least two nails, is the foundation of anchorage. Note in the photograph below the result of cleats too small, with one nail. The recommended cleat dimensions are shown above.

reported "failures" of copper roofing? To put it bluntly and briefly in two words—"IM-PROPER APPLICATION." In the main, this means that proper allowance for expansion and contraction have not been made, although other factors have entered into the picture. Chief among these is the factor that can be aptly called "anchorage." As anchorage is a fundamental problem, it is the factor which we will consider first of all.

The recent Confucius stories have familiarized us with many clever "Chinese proverbs." Of all that are assigned to that ancient race "a picture is worth ten thousand words" is one of the most apt. Therefore, photographs of actual installations illustrating good and bad practice, and sketches mainly taken from the second edition of the Sheet Copper Handbook of the Copper & Brass Research Association will be used wherever possible.

#### Proper Anchorage

The art of properly laying a copper roof can be summed up—the roof should be "anchored securely with the least possible use of solder." The standing seam method of application lends itself most readily to the carrying out of this simple precept. That is why there are such outstanding examples of the longevity of copper roofs in the standing seam roofs of Hildsheim Cathedral in Germany, dating from 1320; Christ Church in Philadelphia, two hundred years old, and many others.

When a ship lies at anchor in a river, the anchor holds it fast, but permits it to move and swing with the tide. So, too, proper anchorage of a copper roof, or its component parts, holds the roof securely, but permits the component parts to move with expansion and contraction due to temperature changes. Anchorage may be improper because it holds the metal too tightly (as by direct nailing—which is not real "anchorage") or by not holding securely enough, or, in time, by not holding at all.



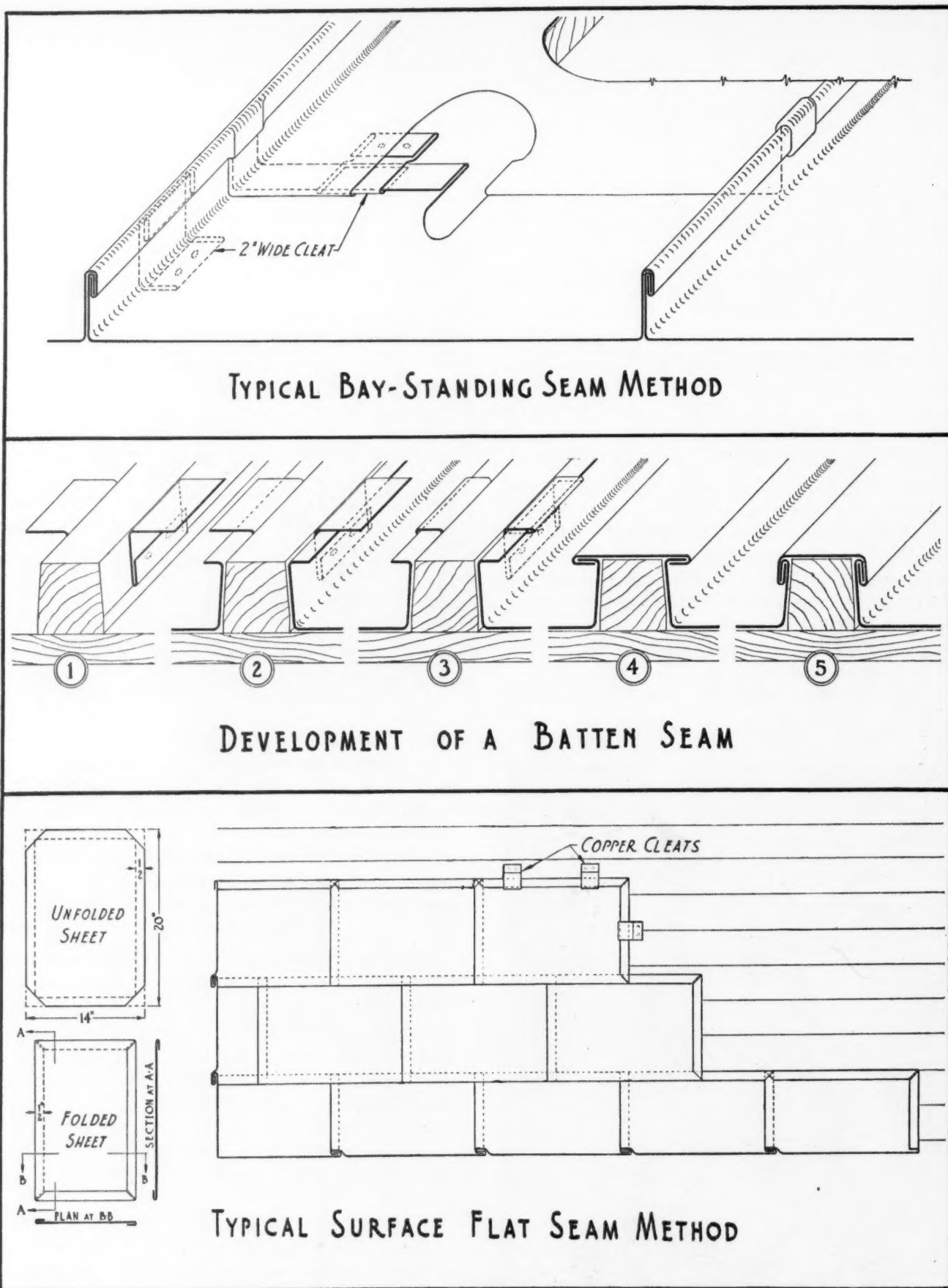


Fig. 4—Illustrated above are the three standard methods of cleating a standing seam, batten, or flat locked copper roof. If these methods are followed, the anchorage will last as long as the copper and the roof will last for centuries.

The basic unit of roof anchorage is the cleat. Cleats should be made of 16 oz. soft copper not less than  $1\frac{1}{2}$  inches wide, preferably 2 inches, and fastened with two copper or copper alloy nails as shown in Fig. 1. The length of the cleat

is determined by the kind of seam with which it is used and the end of the cleat should be turned back over the nail heads.

The maximum spacing between cleats is usually about 12 inches, although a spacing of 8 inches

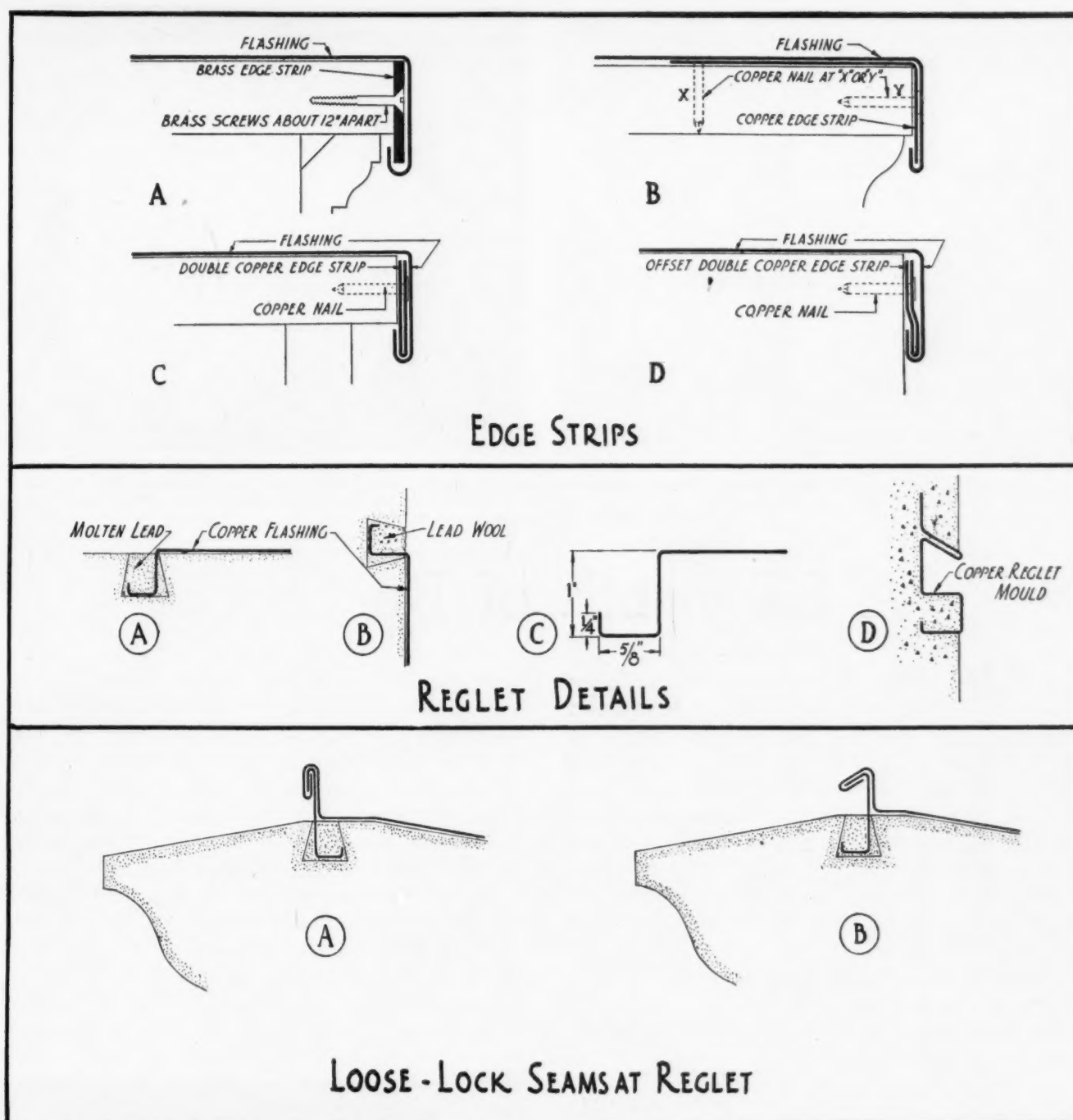


Fig. 5.—The methods used to hold in place the edges of roofs are highly important and frequently neglected. Edges should be held firmly enough to resist high winds. At the same time, provisions must be incorporated to permit movement of the sheets. Above are the recommended practices. Anything less substantial will not last.

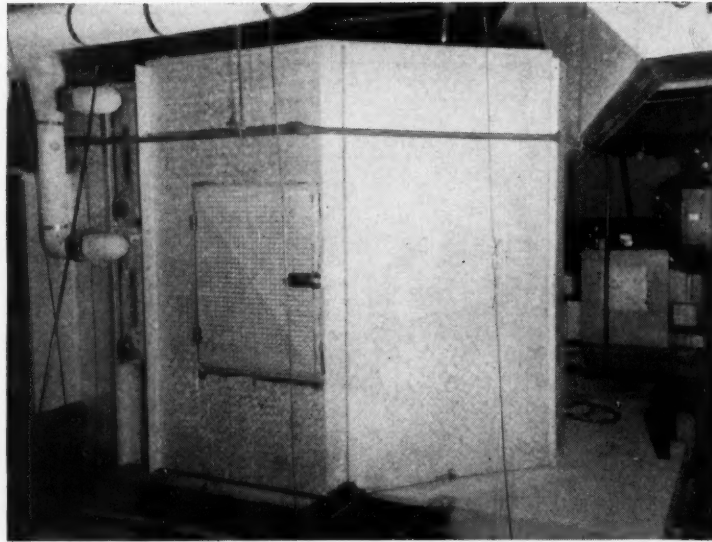
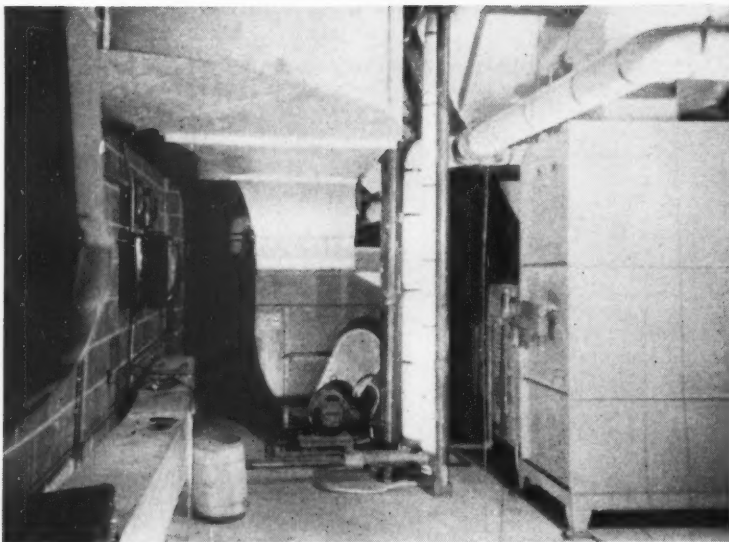
is often desirable. Several types of nails may be used, as shown in Fig. 2, but flat head copper or copper alloy wire nails not less than No. 12 gauge and not less than 1 inch long are recommended for nailing into wood and nailing concrete. Gypsum slab usually requires at least 2 inches of penetration and a copper alloy to give additional stiffness. Cut nails give better holding power.

There are some places where it is practically impossible to use cleats, but direct nailing should not be used to secure any copper over 12 inches wide. Also, direct nailing should not be done on more than one edge. The other edge must be free.

The use of copper or copper alloy nails for securing the cleats is a very important item. When it is overlooked, trouble will ensue. One of the accompanying photographs (Fig. 3) shows examples of some very bad cleating and nailing. The cleats were too narrow to hold at all—they had only one nail—and this nail was of ferrous material and rusted. The result was that after a comparatively short service the "anchor" of this roof had failed completely. The whole roof had to be renewed because of the improper cleating.

The three illustrations in Fig. 4 show the standard methods for incorporating cleats with different types of roof application. In standing seam  
(Continued on page 106)





Equipment housings for special services were fabricated as angle iron framing and standing seam connections. These two photographs show filter-coil and fan housings in the attic. Both these units are for special ventilating systems.

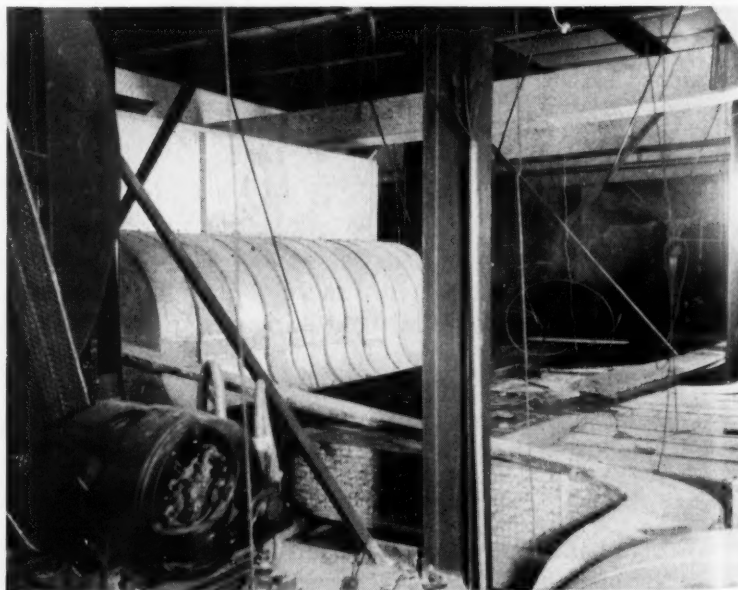
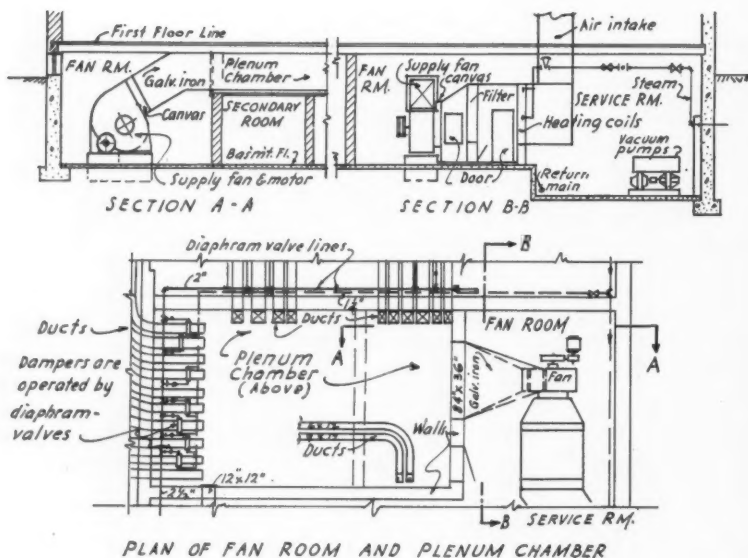
## A Labyrinth of Ductwork

ONE of the most complicated ventilating contracts of 1939, in point of poundage of ducts crowded into restricted spaces, was fabricated and installed by the M. Den Braven Company, Detroit, in the School of Music, Michigan State College, East Lansing, Mich. (Malcomson, Calder & Hammond, architects; Snyder & McLean, consulting engineers).

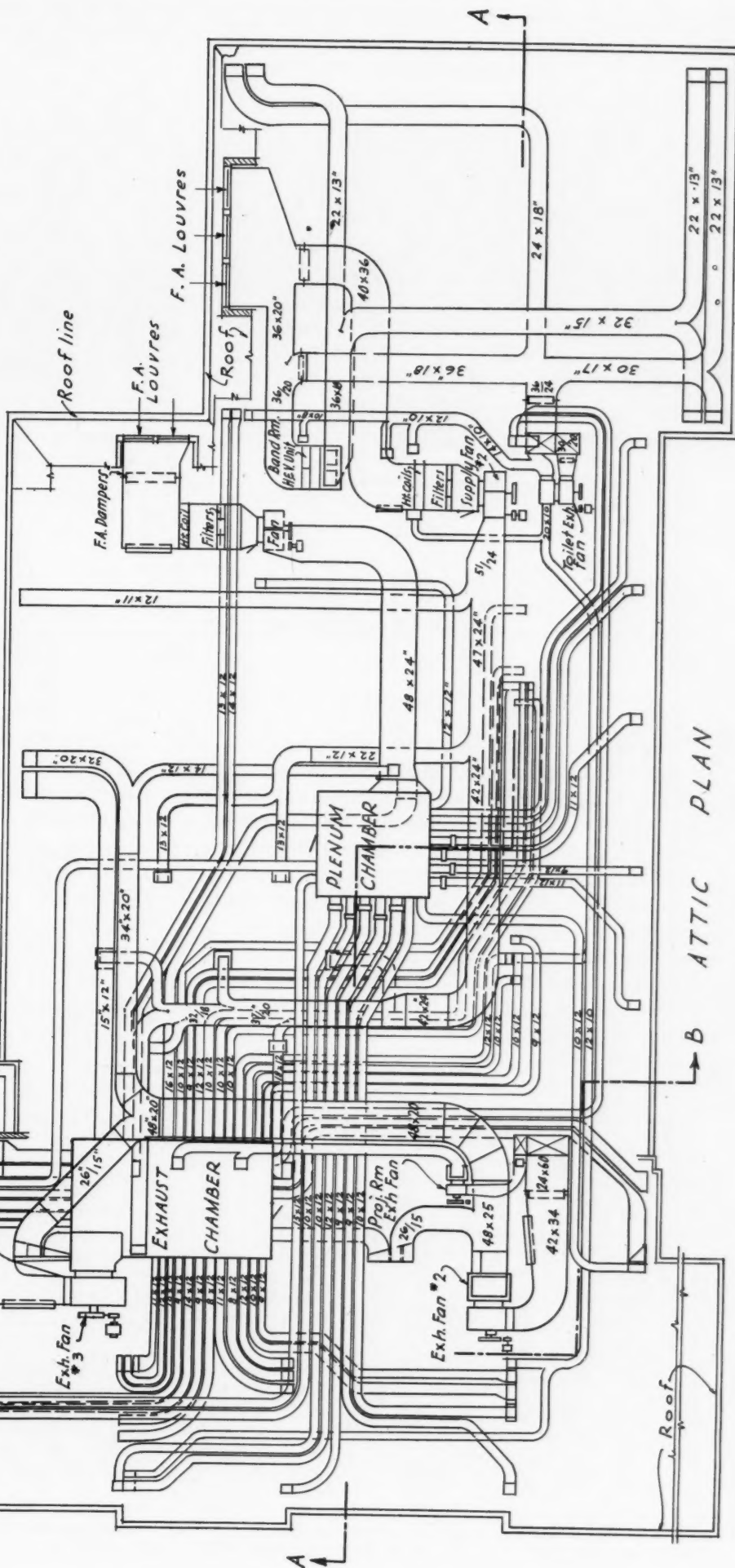
For the contract, some 60,000 pounds of galvanized iron were required and most of this was fabricated into ducts and equipment housings installed in the attic and basement of the building in congested rows of parallel ducts. The reason why there are so many runs of pipe is because

each studio, class room, practice room, etc., is individually supplied and controlled and therefore requires one or more supplies and returns. Most of these ducts originate at one of three plenums—one in the basement (supply) and two in the attic (one supply and one exhaust) as shown in the details and plans or connect to supply or exhaust fans for special service, such as toilets.

While the basement has about as many pipes as the usual ventilation system, the attic is one maze of ducts which criss-cross over, under and around other ducts forming complete platforms in several sections of the attic. What this meant in laying out the duct work and getting the ducts

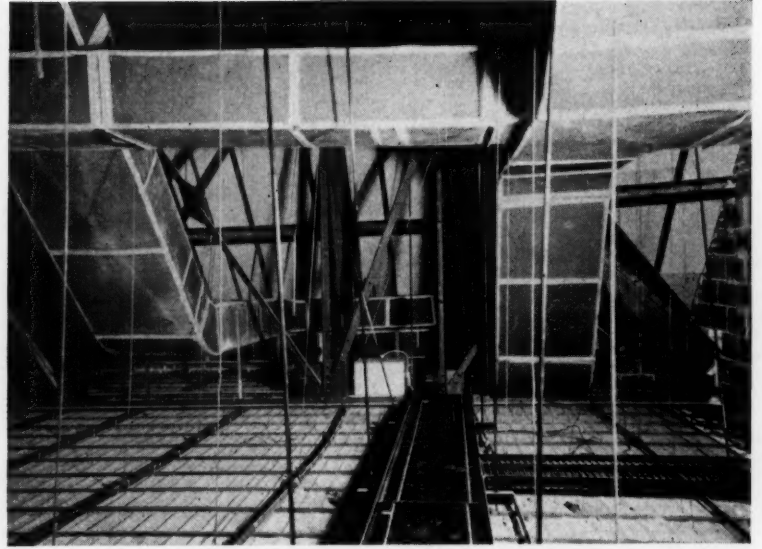
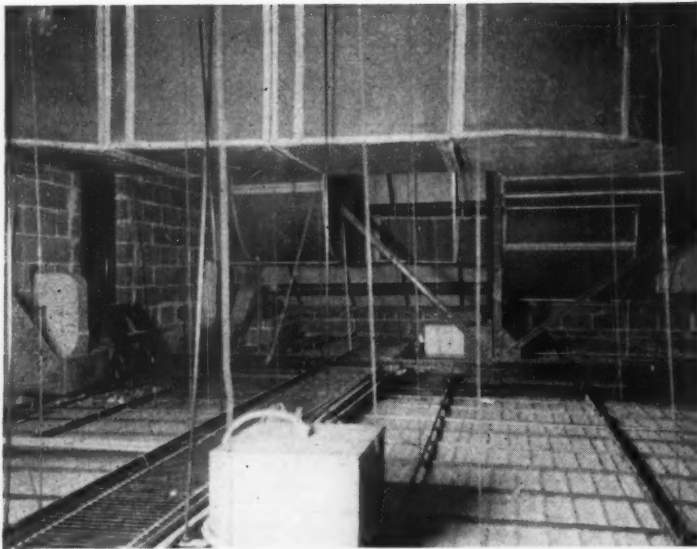


At left detail and right photograph of a plenum showing the construction, arrangement of equipment and the maze of pipes which leave or enter plenums. Duct nests are so solid in some areas that space to run pipes was at a premium. Forming and cutting straight lengths on the job enabled Den Braven to get the ducts in place.



67





All ducts through unheated spaces (this is in attic) are insulated against heat loss or heat gain. Insulation was applied in panels cut from rolls and bound on corners and joints with tape. Insulation was pasted on.

in place can be imagined from a study of the attic plan. Some additional idea of the pipe work is indicated in the various photographs taken in the attic.

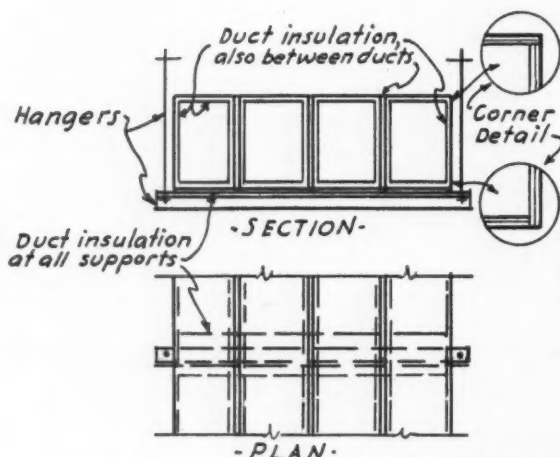
#### Window Sill Supplies, Grilles

In addition to the complexity of the duct work, numerous other interesting features were included in the contract. For example, one of the details shows the window sill supplies which were used in all first floor rooms having an outside wall. The supply ducts for these sill grilles originate at the basement supply plenum and rise to the high sill through the vaned fitting shown in the detail. In other parts of the building, registers are located in outside corners of rooms 8 feet 6 inches above the floor.

#### Everything Insulated

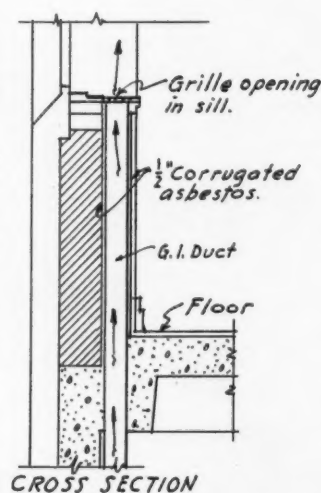
A most interesting feature of this contract is the precautions taken to insulate the ductwork against temperature loss and to prevent noise transmittal through the ducts. In all some 700 rolls of Dux-Sulation were used in and on the ducts. Two of the photographs show some of the attic ducts insulated against temperature loss; details show inside pipe application of sound deadening material. Den Braven did not do the actual insulating, but sub-contracted the work out to Murphy Asbestos Co., Lansing.

The installation of the insulation was incorporated with the fabrication of the duct work. Since the Den Braven shop is in Detroit and this job in East Lansing a job shop was installed in the building. A Pittsburgh lock forming machine,

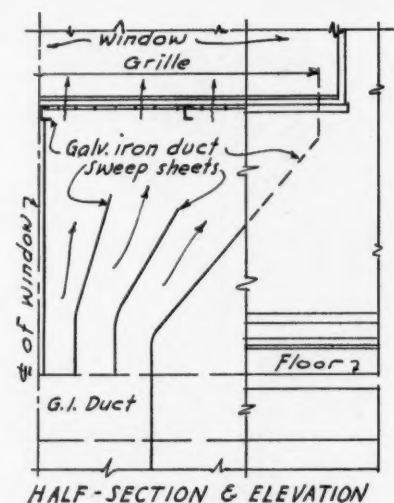


DUCT SUPPORTS - DETAILS

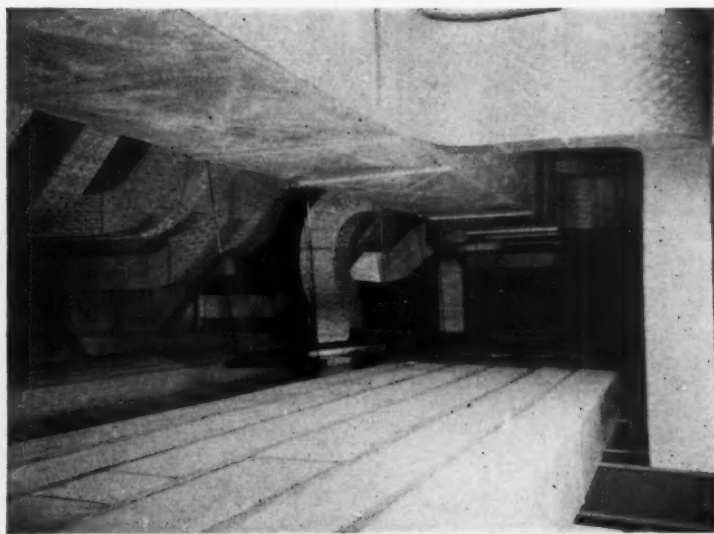
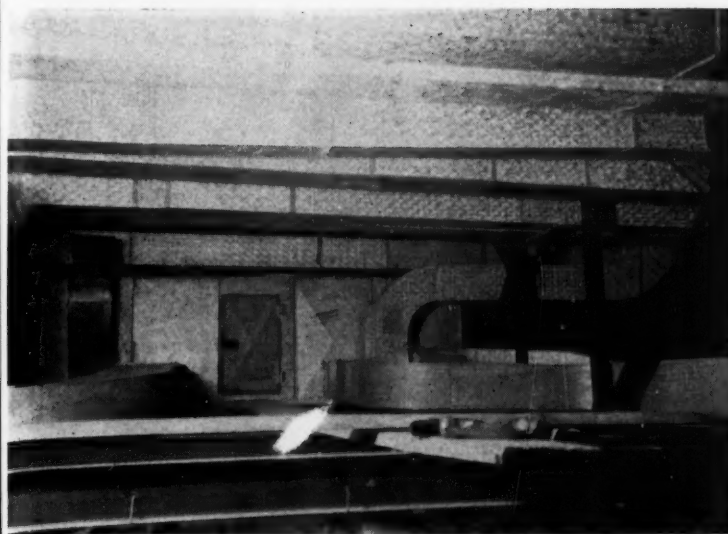
A special method was used to hang ducts. Insulation was placed between each pair of pipes and between the pipes and the hanger as precaution against noise.



CROSS SECTION WINDOW AIR SUPPLY DUCT - FIRST FLOOR



On the first floor, these special window sill grilles and transitions were used. Ducts were in the basement. Sweep strips were used to obtain uniform air flow.



Two views of an attic plenum and the runs of pipe nearby. So many pipes were required that ducts were nested on the floor and nested at the ceiling. Fittings were fabricated in Detroit, but straight sections were made on the job as the only method whereby the maze of pipes could be accommodated.

brakes, shears and hand tools were supplied. For all ordinary sized ducts, the sections were made as a top and one side and a bottom and one side, each with one Pittsburgh. The sections were put through the lock forming machine and then through the brake. Each two-sided piece was lined before assembly by an insulating crew working at a bench beside the brake.

#### Fittings Made in Detroit

The exception to this plan was the elbows and transition fittings which were made up complete in the Detroit shop and delivered to the building ready to install. An average of ten men were on the job for some 10 months fabricating and installing the system.

The housing for the equipment and the plenums were all built on the same plan—angle iron framing, 18-gauge galvanized iron siding, standing seams vertically to join sheets into panels. The housings are shown in several pictures.

#### Special Duct Suspension

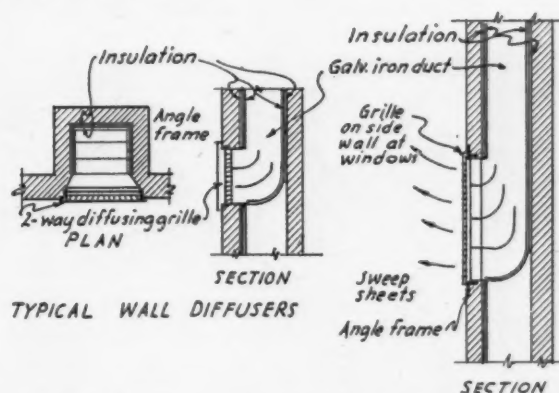
In the attic and the basement where ducts are suspended the type of suspension shown in a detail was employed. Where ducts were nested, as shown, sheets of insulation were placed between the ducts to prevent metal to metal contact. The insides of all ducts were lined as shown for sound insulation. In addition, a narrow strip of insulation was laid across each duct support angle under the ducts.

The insulation against sound transmittal was carried further. All vertical risers (metal ducts in masonry) were lined inside with sound blankets, continuous from grille to plenum. The plenums and exhaust chambers were also lined so

that, on completion, practically the entire system is lined with acoustical liner. Some of the details show these applications. Dux-Sulation was used as lining.

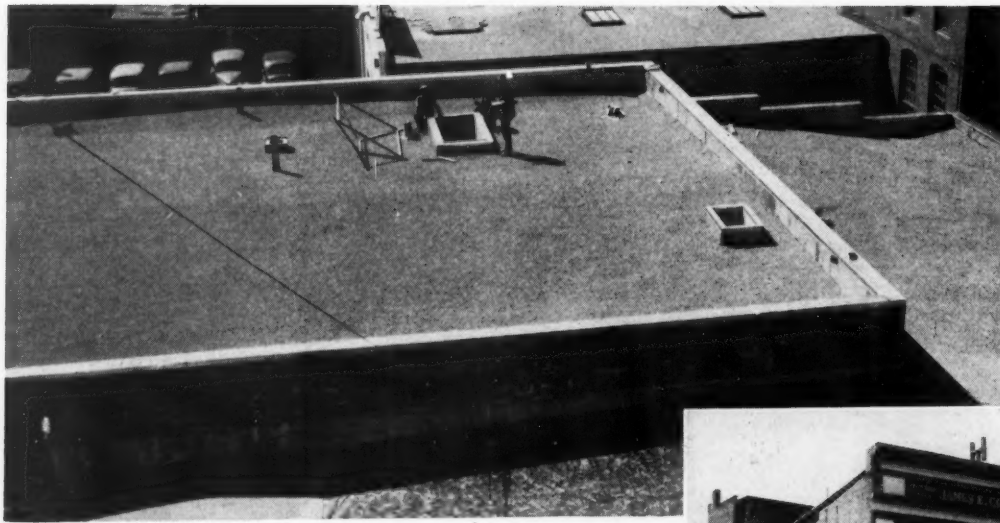
#### Erection Procedure Difficult

It was impossible to lay out beforehand any hard and fast procedure or erection schedule because of the complications of the piping. So far as possible, complete runs were connected up in order to avoid getting the wrong pipe on any given grille, but working conditions in the attic and basement determined more than anything else how and when each piece of pipe work should be installed. The cutting and forming of the straight sections on the job enabled the crews to take actual measurements so necessary where so much pipe is nested beyond the first one or two elbows. Keeping elbow radii uniform made it possible to make up elbows in Detroit and filling in with straight pieces measured and made on the job prevented costly waste of material of wrong size or dimensions.



High side wall grilles connect into inside insulated risers as shown here. Inside insulation was adopted to prevent noise transmittal from room to room.





Above—General view of roof and, right—contractor Cobey's shop. In addition to the parapet (described) the skuttles, skylights and a stair house were flashed for protection.



## Full Metal Casing for Parapet Protection

By R. C. Nason

ON the new building of the United Illuminating Company, New Haven, Conn., sheet metal contractor James E. Cobey, New Haven, recently fabricated and installed some 10 tons of 16-ounce copper as flashing for parapets, copings, side walls, etc., employing some interesting methods.

The copper used was both bright and lead coated divided as follows:

Some 800 linear ft. of flashing that includes coping, cap, parapet sidewall and base varieties.

The method of joining coping to capping to side-wall makes use of a special design made up by this contractor. Special "throughwall" lead coated coping flashing was furnished for the work, being sufficiently wide to provide 1½ in.

(Continued on page 108)



Contractor Cobey worked out the special method described for completely encasing the parapet in metal. These two photographs show a closeup of the cap; also the inside wall sheeting which is soldered; and explains how so much metal could be used on an average sized roof.

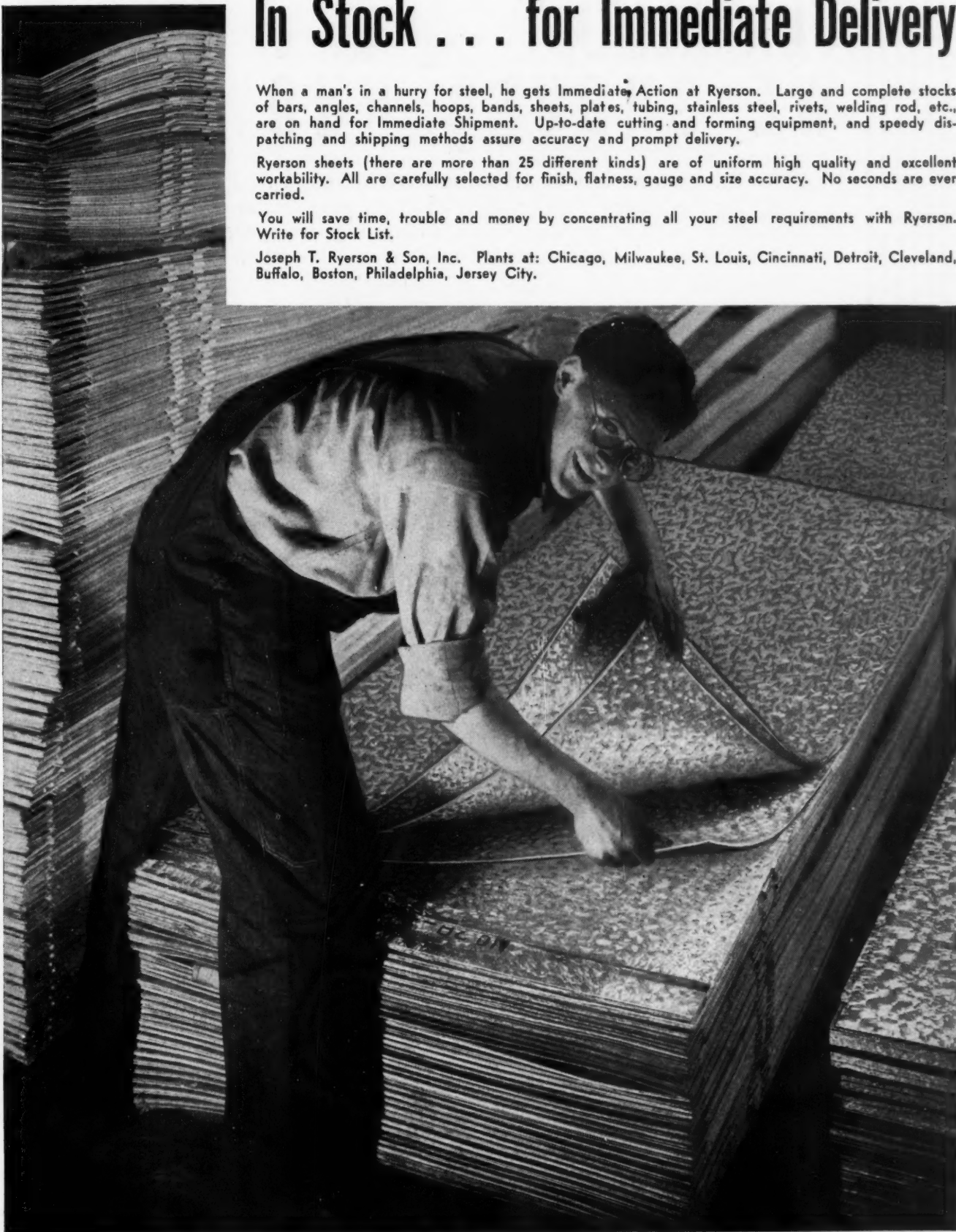
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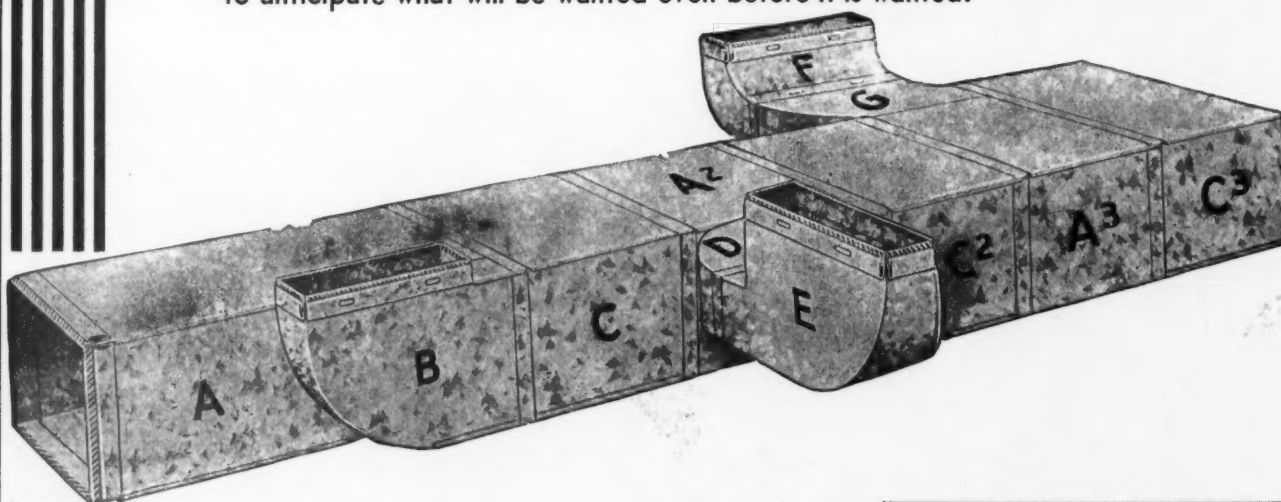


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But it takes more than a past dating back to 1866 . . . It takes more than making the furnace pipe by which all others were measured during all these years—it requires (more than ever, today) engineering foresight and ability to anticipate what will be wanted even before it is wanted!



## *And We Have Done Exactly That in HANDY Pre-Fabricated Duct Work!*

This pipe, shown above, is better engineered, fits better, looks better, costs less to handle, circulates air with less friction and helps YOU do better jobs.

In the "sample" assembly A, A-2 and A-3 are straight sections; B is our new G-290 elbow; C, C-2 and C-3 are two-way splitters; D and E are No. G-23 reverse elbows; F is a G-16 elbow and G is a G-24 reverse elbow.

**Determine  
TODAY**

that you will save  
money in 1940  
with Handy Pre-  
fabricated duct  
work.

Materials and workmanship are up to the standards maintained in HANDY PIPE for over 70 years—and if your duct-work information doesn't include our new Duct-Work catalogue, it isn't up to date. SEND FOR A COPY AT ONCE.

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**PEORIA ILLINOIS**

If you haven't our catalogue No. 52 write your name below—or send a post card request.



**"Good Old  
HANDY PIPE"**

is still the standard of quality and the "bread-and-butter" maker for every contractor who uses it.

# BOOKKEEPING—

## "Streamlined" for 1940 Requirements

By Joseph G. Dingle

C. P. A., Ottawa, Ill.

Some months ago, hearing J. G. Dingle discuss bookkeeping before a furnace men's association, we asked for an article or two on bookkeeping for 1940 business requirements.

We specified, if possible, that the article should not use any bookkeeping terminology. Further discussion disclosed that what seems to be necessary is a complete bookkeeping SYSTEM, which will enable the contractor whose office girl does bookkeeping along with other duties, to keep the kind of records needed today. The idea of not using bookkeeping terms intrigued Mr. Dingle and this first article attempts to find why the business man won't learn the bookkeeper's language. We think he "has something here." The articles which will follow will develop a complete system, "streamlined" for 1940 needs.

The system will be available later at a nominal cost.

**D**ID you ever hear of a contractor who handed out money to his mechanics on Saturday without some kind of a pay roll record?

Do you ever send checks to your supply houses without knowing just what you owe them?

Do you give receipts to your customers without first determining that the amount paid is correct?

Do you quote prices without attempting to figure your costs?

Of course you do not do these things. They are elemental business "don't's."

These are a few of the several acts which, taken collectively, form the thing you call your "business." You buy, you sell, you construct or install, you pay out money. That's business.

Many business men seemingly believe that by carefully watching each individual "business" transaction they can properly manage their business. What they usually fail to realize is that each transaction, complete in itself, probably, is so closely related to other transactions that sooner or later the entire puzzle must be put together in one completed whole to determine the net results of the operation of that business. Too often, due to failure to evaluate some small part of the whole, the complete picture is not so satis-

factory as it would seem.

Bookkeeping is the art of recording the many, varied transactions of your business in such a way that there results a complete picture of your operations, large and small, properly placed, fully evaluated. Bookkeeping is, then, not a matter of importance, but a major part of your business.

Bookkeeping is not new. In much of its present form it dates back to Father Pacioli, an Italian monk, who, in 1494, wrote a treatise on double entry bookkeeping.

Bookkeeping in some form, perhaps pretty poor, was present when you opened your business. Bookkeeping will place the final value on your efforts when you have passed along.

But, while bookkeeping as a form of business record is not fundamentally new, it has seen many changes. Before 1913, when the Income Tax came along, a fellow's business was his own affair and the matter of bookkeeping was not quite as important as it has since become. Uncle Sam, since 1913, has become the silent partner of every man in business—he demands to know just what you are doing. He demands his full share of all and any profits—but he is not the least bit interested in your losses except that you



must prove losses are really losses.

Today, with competition in every business as intense as it is, with numerous seen and unseen taxes and many other elements affecting your profit making possibilities—bookkeeping is likely to be the one thing which will permit your staying in business. Bookkeeping, and bookkeeping only, affords the day by day, week by week, month by month check on all the things you do in business—it tells what are your costs; how much is your overhead; whether your prices are profitable or costing you money; whether or not your business is going ahead or losing ground.

#### Why Don't Dealers Know Bookkeeping?

If we will admit that bookkeeping is essential in modern business conduct; that only through bookkeeping can the sheet metal or furnace contractor keep his business ship afloat; that only through bookkeeping can all the ramifications of present day contracting be recorded—why is it that so many men in business are woefully ignorant of bookkeeping fundamentals?

Many reasons for this attitude have been advanced. Some say bookkeeping is too difficult to understand. Some say bookkeeping requires a certain type of mind—not usually possessed by the contractor. Some say men are afraid to know the truth about their business affairs—that in ignorance there is a sense of security. Some say

the small contractor just has not got the time to devote to bookkeeping.

The real reason is a problem—which reminds us of the Negro preacher, who, after reading a rather complex passage from the Bible, commented briefly upon the complexity of the text and then calmly announced that he would proceed to “unscrew the unscrutable.” Let’s explore this problem a little farther. As the author looks back over some thirty-odd years in the business world, he sees many changes. New and better ways of doing old things. New and better goods produced. Shorter hours and more comfortable working conditions, and many of these not just since the Social Security Act was passed. We have seen the horse and buggy disappear and the automobile and truck take on every-day uses. We have seen gravel roads replace the mud; the concrete replace the gravel road; now we are beginning to talk of “super-highways.”

#### We Learn Many New Words

We have seen many new words and phrases come into our daily use. Every business activity has its own vocabulary. In some cases new words have been coined to fit the purpose, and in others, old words have come to take on new and different meanings. Pause for a few minutes and see how many new words have been added to your everyday conversation. The words have come along so



gradually that you have not realized it. In your own business you can probably talk for hours on "heat losses," "air conditioning," "dehumidifying" and many other words that were foreign to you ten or fifteen years ago.

Perhaps you play golf. You may be a good golfer or just a dub, but there's one thing we can bet on. You can talk the language of golf with the best of them. You have probably worn "plus fours" and, like us, wondered where the "plus" part comes in when, as a matter of fact, they appeared to be minus something. One of the first things a golfer learns in his "stance" and his "swing" and he acquires a bag full of "clubs" with queer names.

All this doesn't faze him. He acquires a complete golfing vocabulary, and is not bothered a bit in doing so. When he speaks of the "tee" he is not thinking of a tea container. He can talk of "birdies" and "eagles" without thinking of feathers. A "hole in one" brings much happiness on the golf course; at home it usually means just an old pair of socks.

We could pursue this thought for pages and pages, but believe we have brought home our point—that with the changing conditions—changing times—our business man has, without effort, kept abreast of the times and kept his vocabulary up to date.

#### Bookkeeping No Harder Than Golf

Yes, with but one exception. There is one blind spot. This same fellow, who prides himself on his ability to master quickly and completely the new words of the golf games; the new words of his changing business; in fact, the new words required to express everyday news, such as "billion," "Relief-client," "planned economy," and "economic royalist," has steadfastly refused to master the so-called technical words of the bookkeeper.

There must be some good reason why the typical business man, who can, and usually has, mastered the vocabulary of golf, of automobiles and many other fields, including his own business, has steadfastly refused to master the language of bookkeeping, a matter vitally affecting the very existence of his business. Let us explore the question and perhaps explode a few old ideas.

Like golf, there are certain words and phrases used in bookkeeping, each having a real and distinctive meaning. It is our opinion that not one business man in ten can successfully define these bookkeeping words and phrases—notwithstanding the fact that they have been in general use in bookkeeping circles for several centuries. Why such a condition exists is beyond our comprehension.

Is it because the words and phases are too com-

plicated? Certainly there are no words in the bookkeeper's vocabulary as queer and freakish as "plus fours," "mashie," "niblick," "stymie" and other good golf words.

Is it because the bookkeeper's art is not as commonplace as golf? Look over your golfing friends and make a mental calculation of the percentage of them that are in business and you will be surprised to find that a very high percentage of them have some contact, either directly or indirectly, with bookkeeping. They have all mastered golf terms and can and do use them frequently and properly, yet just try them out in a conversation on bookkeeping and you will find them sadly deficient in their knowledge of the technical words which are common to the bookkeeper. It can not be because bookkeeping is more rare than golf that this blind spot exists.

Is it because bookkeeping is of minor importance to the owner of the business? In the minds of many business men, bookkeeping is of minor importance, but just how can a man manage a business successfully without some guide by which to measure the efficiency or lack of efficiency? He can no more accomplish this result without bookkeeping than a ship captain can bring his ship across the ocean without navigation instruments and a thorough knowledge of their use.

#### Men Don't Discuss Business Details

Thus far, we have failed to find the proper explanation for the average business man's failure to know and use the technical terms of bookkeeping. Let's approach it from still another angle. Let's see if we can blame it on the fact that while business men play golf together and in their social contacts discuss golf, automobiles, and all kinds of subjects—each having a vocabulary of its own—they do not discuss business operations except in its more general phases. To use a common slang phrase, "we believe we have something there."

The typical business man will talk to anyone about his golf game; he will praise his automobile; but he will not discuss his business affairs with even his best friends. To talk golf, he must know and use correctly the golf terms. Perhaps if he did discuss his business in detail with his friends and customers, he would find that he must know and use correctly the technical words used in his business, which, of course, would include the bookkeeping words and phrases. He would be ashamed to admit that he had not or could not master the technical words.

Let's explore one more possibility. Can it be possible that the boss is afraid to show his ignorance to his bookkeeper? Here, again, we believe we have something. We frequently find

*(Continued on page 110)*



**YOUR FURNACE SHOULD BE  
CLEANED EVERY YEAR!  
NOW IS THE TIME!**

By our thorough Vacuum System you are sure of efficient heating service next winter. All dirt and soot is removed without dust or muss. \$4

FOR A DEPENDABLE FURNACE  
AND SHEET METAL DEALER  
**CALL MA. 6377**

**WARM AIR FURNACE  
& AIR CONDITIONING LEAGUE, INC.**  
We Use Moncrief and Niagara Original Parts

**FURNACE REPAIRS—CLEANING  
NOW IS THE TIME!**

Safeguard your health: be efficient with your furnace cleaning. A thorough cleaning by Vacuum includes smoke pipe and bottom of chimney. For a dependable Furnace and Sheet Metal dealer. Call MA. 6377

**WARM AIR FURNACE  
& AIR CONDITIONING LEAGUE, INC.**  
Niagara and Moncrief Original Parts

**Your Furnace  
& Recemented**

For efficient heating next winter, check your furnace NOW! Take advantage of our summer special. Call MA. 6377 for a dependable sheet and metal dealer.

**\$12**

**WARM AIR FURNACE & AIR  
CONDITIONING LEAGUE, INC.**  
We Use NIAGARA and MONCRIEF Original Parts.

**A Faulty Furnace is a  
Lot of Trouble**

Let Us Install a Dependable  
Furnace Now

A phone call will bring an expert furnace man for inspection and honest advice on your furnace. No obligation or charge for inspection service or advice.

**FURNACES VACUUM \$4  
CLEANED.....**

FOR A DEPENDABLE FURNACE  
& SHEET METAL DEALER Call **MA. 6377**

**WARM AIR FURNACE  
& AIR CONDITIONING LEAGUE, INC.**  
We use Niagara and Moncrief Original Parts.

**HAVE YOUR FURNACE  
LOOKED AT NOW!**

Genuine Original  
**FURNACE PARTS on All Repairs**

Don't delay having your furnace thoroughly inspected for efficient heating this winter. **DO IT NOW.** A phone call will bring an expert for inspection and honest advice on your furnace and lens. No obligation or charge for inspection service or advice.

For a Dependable Furnace and Sheet Metal Dealer Call **MA. 6377**

**FURNACE  
RE-CEMENTED ..... \$12**

**WARM AIR FURNACE  
& Air Conditioning League, Inc.**  
We Use Moncrief and Niagara Parts

## Cleveland's "League" Has Advertised Co-operatively for 5 Years

By Irwine Lewis, Secretary

ABOUT six years ago three or four men in the warm air heating business in Cleveland became very much disgusted with the way the warm air heating business was being abused.

They determined to try and organize the dealers of Cleveland and suburbs into a group, for public recognition, as legitimate heating contractors and not as just alley tinnners and so-called furnace men. To obtain this recognition the ultimate goal was an advertising campaign in Cleveland newspapers, to be paid for by all participating.

From experience these men knew that any advertisement is only as good as its sponsor and to get the public to read an advertisement and have faith in it the sponsor must be legitimate in every way. This the sponsors of these ads have tried to be. As sponsors of cooperative advertising the group quickly received the good will of the city newspapers and all of the public utilities.

After three or four months of existence, this group, by a majority vote, adopted a name—The Warm Air Furnace and Air Conditioning League, Inc. The growth of this League was phenomenal;

**A Faulty Furnace is a Lot of Trouble**

LET US INSTALL  
A DEPENDABLE  
**NIAGARA  
FURNACE NOW**

A phone call will bring an expert furnace man for inspection and honest advice on your furnace. No obligation or charge for inspection service or advice.

**FURNACES  
VACUUM  
CLEANED  
\$4**

FOR A DEPENDABLE FURNACE  
& SHEET METAL DEALER Call **MA. 6377**

**WARM AIR FURNACE  
& AIR CONDITIONING LEAGUE, INC.**  
WE USE NIAGARA AND MONCRIEF ORIGINAL PARTS.

The advertisements appearing on these two pages appeared in the Classified Sections of various Cleveland newspapers during the period June 1 to December 1, 1939. Every day an advertisement appeared in at least one paper. The advertisements stressed cleaning and resetting and the name of the association. The advertisements are shown in approximate full size.

in a very short time the League had a membership of about 150 dues-paying members. All of these accomplishments were gained without help from anyone.

#### Advertise for Public Recognition

After being fully recognized as a body of warm air heating contractors by Cleveland furnace manufacturers and jobbers, the officers of the League set out to get public recognition for the League through the advertising program originally planned. Of course, financial help was needed to put this across. So the League turned to Cleveland manufacturers and jobbers of warm air heating equipment and sheet metal material and invited them to contribute to the program of advertising. Their response was gratifying. Pledges were made for very substantial sums of money. These pledges were accompanied in most cases with a check.

The advertising planned has always been of the display type and has been carried in the city daily and Sunday newspapers. Some ads appeared in suburban newspapers. These ads had two purposes—to get public recognition for the League and to establish standard prices for services that are common in warm air heating. Cleaning and resetting of furnaces have had the most space. These ads were carried for as long a period each year as funds would permit. The calls received in answer to those ads have been very satisfactory and promising.

#### "Call Bureau" Distributes Inquiries

All inquiries have been handled through a "Call Bureau," which is set up to render a service of this kind. These calls generally are distributed in rotation to the League members, but some calls are made direct contacts between contractor and caller through the Call Bureau. Many sales have been made through these calls; some, of course, were just requests for information only.

With results as splendid as they were the first year, the following year the League set out to carry on from where it left off the first year.

Pledges were again solicited from the same sources and again the League succeeded in raising the quota set up by its advertising committee. The second year more calls came in, more sales were made and more information calls came in, indicating the public was gaining confidence in the League.

The League is now about to start on its sixth annual advertising campaign, but for 1940 the advertising committee requested more money for a more extensive campaign. Probably some new medium of advertising will be undertaken. The League hopes it will succeed again as in the past.



**YOUR FURNACE**  
*Vacuum Cleaned* **\$4**

A thorough cleaning by Vacuum, includes smoke pipe, for only \$4. Now is the time to have your furnace cleaned!

**FOR ONLY—**

For A Dependable Furnace and Sheet Metal Dealer, Call  
**MA. 6377**

**WARM AIR FURNACE & AIR CONDITIONING LEAGUE, INC.**  
WE USE NIAGARA AND MONCRIEF ORIGINAL PARTS

**FURNACES INSTALLED • REPAIRED • CLEANED**

Phone Us About a New  
**MONCRIEF FURNACE**

Expert inspection service and HONEST advice—as near as your phone.  
Call NOW—don't suffer inconvenience when winter comes.

**FURNACE VACUUM CLEANED \$4**

**FOR A DEPENDABLE FURNACE & SHEET METAL DEALER Call MA. 6377**

**WARM AIR FURNACE & AIR CONDITIONING LEAGUE, INC.**  
WE USE MONCRIEF AND NIAGARA ORIGINAL PARTS

**YOUR FURNACE SHOULD BE CLEANED EVERY YEAR!**



**NOW IS THE TIME!**

By our thorough Vacuum System you are sure of efficient heating service next winter. All dirt and soot is removed without dust or mess. Phone us now.

**\$4**

**FOR A DEPENDABLE FURNACE AND SHEET METAL DEALER, CALL MA. 6377**

**WARM AIR FURNACE & AIR CONDITIONING LEAGUE, INC.**  
WE USE MONCRIEF AND NIAGARA ORIGINAL PARTS

*Your Furnace*

For A Dependable Furnace and Sheet Metal Dealer, call—  
**MA. 6377**

**CLEANED AND RECEMENTED**

For efficient heating next winter have your furnace cleaned including smoke pipe inside and out of furnace and removal of all dust, soot and ashes for only \$12

Should your furnace require replacement parts, remember every member of this League uses genuine, original Moncrief and Niagara parts, assuring you perfect fit and long service.



**WARM AIR FURNACE & AIR CONDITIONING LEAGUE, INC.**  
WE USE NIAGARA AND MONCRIEF ORIGINAL PARTS





President C. A. Olson spotlights the meeting's features—publicity and research.

**T**HE two basic functions of the National Warm Air Heating and Air Conditioning Association—publicity and research—were once again placed in the spotlight at the mid-year meeting, June 3rd, 4th and 5th, in Chicago. Spotlighted at the very beginning by President C. A. Olson, these two functions dominated all committee meetings, session papers, and the scheduled and off-the-record discussions throughout the convention.

Said President Olson—"Our equipment has changed completely in the last twenty years; dealers today are better than they were twenty years ago; progress in research and association publicity has been carried forward economically; but much remains to be done. Some manufacturers are still riding the coattails of the members who pay the bills. We need a national advertising campaign to tell the owner what is a good system and how the good system should be installed. Competition, inside and outside the organization, is becoming more intense and this can lead to a lowering of quality of products and installation unless this association takes steps to combat this trend.

"Smaller houses, more restricted space for heating equipment, houses without basements, houses costing under \$4,000, are just a few of the problems which must be solved by research and merchandising. Residential construction is reported to be 18 percent ahead of the same period of 1939 and we confidently expect a boom residential building year.

"We are engaged in reclassifying contributing members so that all members will contribute their just share of association expense. During the last war, this association offered its services; once more this association pledges its full support to any government request."

#### "Yardstick" Moves Along

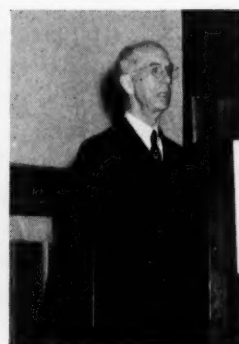
At the winter meeting in Cleveland last January, the association announced a proposed "yardstick"—a booklet designed to tell the consumer by means of drawings and brief explanation what constitutes a good, a fair and a poor warm air heating installation. A committee was appointed to be known as the publicity and merchandising committee, and a joint committee from the Research Advisory Committee and

## Publicity and Research Dominate Summer Meeting of National Warm Air Ass'n

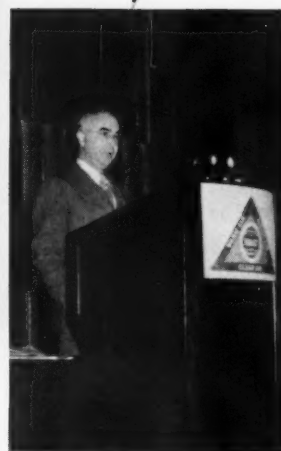
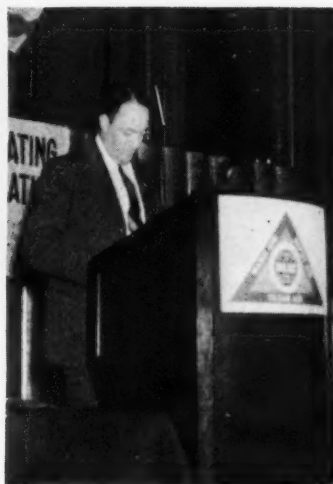
the Technical Codes Committee was also appointed, both of these committees to prepare, edit and publish the proposed booklet. Since the January meeting, the booklet has been written and submitted to many interested members of the association for criticism. Three drafts of the proposed booklet have been made and the fourth draft is in process. The delay in publishing the booklet has been caused by the fact that many critics feel that the original three drafts were too technical for the consumer and many dealers, and that the Yardstick, to function as intended, should be readily understood by both consumer and dealer.

As the matter now stands, a "yardstick" couched in semi-technical terminology and consisting of approximately 24 pages will be printed and distributed to dealers. The dealer will submit his proposal showing the type of system proposed and will use the "Yardstick" to explain how his proposed system meets the a, b, or c classification of the "Yardstick." This edition of the "Yardstick" will not be distributed to the prospect unless the prospect shows a desire to study class a, b, and c systems in detail.

However, the industry feels that the consumer should be made acquainted with good, fair and poor systems and accordingly a smaller 8-page leaflet is being considered for distribution in large quantities to prospects. This leaflet will not describe the characteristics of the three types of systems in detail but will sell mechanical warm air heating and gravity warm air heating as a method of winter comfort and year-around conditioning and, further, will explain that the prospect can obtain full information on class a, b, or c systems by asking the contractor to show the prospect the "Yardstick."



Left to right—I. L. Jones appeals for better cost accounting. R. E. Howe says "We need to build better combustion chambers." Prof. F. R. Watson defines some of the principles of noise elimination.



Left to right—A. F. Frazee outlines the new and old house heating market for 1940. Jan S. Irvine offers the idea of a N.W.A. guarantee on dealers' installations with money refund. J. E. Eckstein says "Industry needs a strong jobbers' association." Frank Mehrings led the publicity and merchandising report and discussion.

Jan S. Irvine, member of the publicity and merchandising committee, presented the first draft of the proposed consumer leaflet to the meeting. The leaflet as visualized consisted of 8 pages, the first page showing how a warm air heating system can provide year around comfort; the second page explaining that a warm air system costs less to buy and install than competitive systems; page 3 explained how a modern warm air system reduces fuel bills; page 4 emphasized uniform temperatures in every room of the building; page 5 explained how responsive a warm air heating system is; page 6 explained how a warm air system provides adequate humidity; page 7 emphasized the ease with which a warm air system can be operated; and page 8 introduced a certificate which the installing contractor would hold from the National Warm Air Heating and Air Conditioning Association.

Mr. Irvine startled the association by declaring that this leaflet should do two, heretofore unprecedented, things. First, would be to issue a certificate to contractors who will sign a pledge to abide by the design and installing recommendations of the National Warm Air Heating and Air Conditioning Association. The association would police these certificates, revoking certificates of contractors who do not live up to rules and regulations.

Secondly, the National Warm Air Heating Association would guarantee to refund the money of the purchaser if the warm air heating system installed by the certified contractor does not provide everything which the contractor guarantees. According to Mr. Irvine, this second phase can be brought about by carrying an insurance policy which will make available refund money to dissatisfied customers.

#### 1940's House Building Market

Nearly as provoking as the guarantee was the address of A. F. Frazee, Dowagiac Steel Furnace Company, who declared that this industry has become so wrapped up in the possibilities of air conditioning that most manufacturers and contractors seemingly have overlooked the very important position of the gravity warm air furnace in today's sales volume. Mr. Frazee produced charts showing the actual volume of gravity and mechanical warm air heating systems as of 1939.

Said Mr. Frazee—"We have become so enthusiastic

over air conditioning that we have ignored the grand old yeoman of middle-class comfort, gravity heat. We send our salesmen out to talk mechanical warm air heating. If, in our enthusiasm, we belittle gravity heat, saying it is outmoded, is obsolete, are we not overlooking potentialities of the heating system which up to now has—and perhaps even now—actually dominated our production and selling business?"

Since 1915, according to records, some 7,866,000 furnaces have been installed. Of these, more than 5,250,000 have now been in service ten years. If it is reasonable to assert that ten percent of the furnaces installed from ten to twenty-five years ago need replacing, we have a potential replacement market of 529,000 furnaces for 1940.

"The government has recently issued a report indicating that in 1940, so far, 58 percent of all furnaces installed have been gravity and 42 percent have been air conditioning equipment. According to records, 1926 marked the peak of furnace sales with a total sale of 511,000 furnaces. In 1939 careful estimates show the industry produced approximately 450,000 furnaces. Since 1940 shows an increase of approximately 25 percent over 1939, it is conceivable that 1940 will show between 500,000 and 525,000 furnaces produced and sold. If so, 1940 will be the greatest year this industry has ever seen.

"We should be interested in what will happen to the replacement market. We can take the government's word for it that of the 450,000 units sold in 1939, 70 percent were gravity and 30 percent were air conditioning units. Adding to this a ten percent to twenty-five percent gain in sales for 1940 and expecting 65 percent of all jobs to be gravity and 35 percent to be conditioned air, we can assume about 350,000 gravity jobs and 185,000 forced warm air jobs in 1940.

"The new home market is of vital interest to us. It is estimated that we need 150,000 new homes to re-



place old homes and at least 450,000 new homes for new families. That is a total of 600,000 new homes in 1940. If we wish to be conservative, let us assume that at least 350,000 new homes will be built in 1940. And if 70 percent of these new homes will have warm air heating, we have a potential sales market in the new home field for 250,000 warm air heating systems.

#### Problem of the Low Cost House

"However, we must consider one other angle—namely, the price of new homes now being constructed. If we take Chicago as a typical example, we find that only .4 per cent of the houses built in 1939 cost over \$15,000; 4.4 per cent were priced from \$10,000 to \$15,000; 12 per cent were priced from \$7,000 to \$10,000; 35 per cent were priced from \$5,000 to \$7,000; 45 per cent were priced from \$3,000 to \$5,000 and 3.2 per cent were priced under \$3,000.

"The Federal Government estimates that 52 per cent of the nation's prospective home builders must build or buy a home costing between \$2,000 and \$4,000. Can this industry believe that the \$2,000 to \$4,000 market will adopt mechanical warm air heating, despite its higher cost? Further, if we believe figures from cities having permits, people do not always replace their old gravity furnaces with conditioned air; they replace gravity furnaces with new gravity furnaces. Of course, the percentage of replacement by mechanical warm air is increasing, but the big market still remains with the new gravity furnace.

"There is another very interesting angle to this picture—the present status of the so-called room heater. We know that there must have been at least a half a million circulators sold in 1939. These were coal-fired, gas-fired or oil-fired. Some depend upon gravity flow and some have small fans for circulation. We also have the gas floor furnace which in some parts of the United States practically eliminates all other forms of heating equipment. Do we believe that we can combat the room circulator and the floor furnace with much more expensive mechanical warm air heating?

"As conditioned air more and more dominates the expensive home field, these newcomers are taking over the great majority of the small homes. 'Don't overlook the gravity furnace' offers, I believe, our greatest opportunity to retain a market that is slipping away from us. If gravity heat is outmoded, the responsibility lies with the manufacturer and the contractor. Why can't we make gravity warm air heating just as attractive to the home owner as any other form of heating on the market? To revive acceptance of gravity furnaces, this industry must think in terms of better design, better layout, better merchandising methods, improved prices, improved selling technique for gravity furnaces, larger profit margins for the jobbers of gravity furnaces and enlarged contractor education in the advantages and limitations of gravity warm air."

#### Needed—A Strong Jobbers Ass'n

The relationship between manufacturer-jobber-contractor was discussed by J. E. Eckstein of the J. E. Eckstein Company, Pittsburgh, jobbers. In summary, Mr. Eckstein suggested that a strong national jobbers association is badly needed. That such a jobbers association can accomplish a great deal of good. That the tendency of many manufacturers to sidetrack the jobber in favor of direct selling to the contractor may

seemingly work to the advantage of the manufacturer, but manufacturers who bypass the jobbers should remember that this sales procedure is possible and advantageous only so long as some other manufacturers continue to follow the manufacturer-jobber-contractor sales channel. If all manufacturers by-pass the jobber, there will be no advantage to any one manufacturer in the way of price saving.

Mr. Eckstein declared that some manufacturers are calling the jobbers industry parasites, but these manufacturers should remember that a jobber survives only on the service that he renders and his survival is proof that this service is needed and demanded by the industry. If the jobber is eliminated, it simply means that all dealers are buying at lower prices and the dealer must maintain stock or the manufacturer must do so.

Mr. Eckstein suggested that the association needs more manufacturer members and a strong jobbers association, within the National Warm Air Association, may be the lever by which these outside manufacturers can be brought into the association. One thing which such a jobbers association could do would be to hold engineering schools in their localities to which all dealers would be invited and to which manufacturers, the research staff, and other authorities could come as instructors. Such a nation-wide school program would be prohibitive if financed by manufacturers or the National Warm Air Association. Such schools can and have been conducted by local jobber associations and even by individual local jobbers, with much success. Since manufacturers have not been able, seemingly, to make the contractor come to the manufacturer or to the association for engineering knowledge, it now remains for the industry to take engineering education to the contractor. The most feasible, the most economical, and the best distribution for such schools should be through local jobbers' associations.

"Build America" a slogan suggested by the National Chamber of Commerce was suggested of R. E. Howe, President, Appalachian Coals, Inc., as a suitable slogan for all manufacturers in 1940. Said Mr. Howe—"The substitution of coal in place of wood was unquestionably a contributing factor to the success of the warm air heating industry and, since 1835, the coal industry and the furnace industry have more or less progressed side by side. It probably would have been more fortunate if the two industries had developed co-operatively, but this remains as something which can be done from here on. The coal industry, as the heating industry, is justly proud of the progress it has made in the last hundred years. We have made coal production a mechanical proposition. You have made comfort a byword of American households. You have made an ugly, ungainly old firepot, hidden away in some cobwebbed corner of the basement, into a beautiful piece of equipment which adds to the appearance of the basement, but have you made any substantial improvements in the heart of your equipment—the combustion chamber? In too many cases the combustion chamber is still the old smoke making, fuel wasting, uneconomical firepot. Oil and gas which have struck the country spectacularly, have undoubtedly concentrated much of your attention on new forms of fuel instead of improvements in combustion for coal.

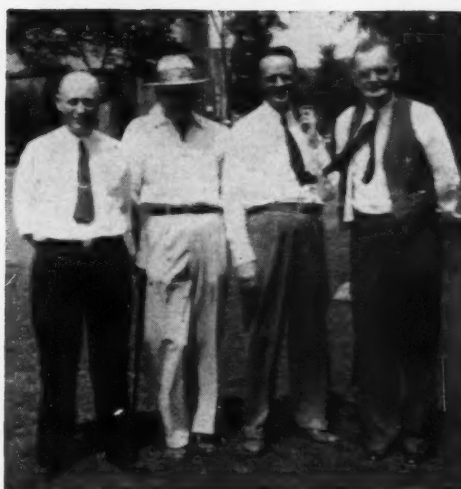
"Since reports show that coal is the fuel used within at least 85 per cent of your furnaces today, may we suggest that some co-operative effort be followed. We have been working with manufacturers of heating stoves to improve their combustion performance. If



Upper, left—Fred Bishop, Bill Woolley, C. E. Pugh, E. M. Burgess during the golf match. Upper, center—Harry Ebbert, D. C. Ellison, Dan Quinnan, Bob Mattingly acting as spectators.



Upper, right—Jim Wilcox, Frank Snowberg, Atlee Wise, Art Rybolt. Lower, center—Harvey Manny, Hugh Courteol, George Boeddener, Reid Mackin (part of the Chicago committee) at the start of play.



furnace firing could be made as efficient and smokeless as modern stove firing, would not a great new market be opened to your industry? Would not modern equipment for coal burning efficiently and smokelessly open to you the market of low-cost houses, slum clearance buildings and all the other projects we hear so much about?

"Despite business depressions, the air conditioning branch of your industry has increased from an \$8,000,000 to an \$80,000,000 industry in the past ten years. Perhaps this comparatively new industry of air conditioning will bring us out of this depression, but in spite of wide acceptance the job of selling is not an easy one. The manufacturers of furnaces must build still better products, you must advertise your product and your service nationally and, above all, your dealers must take full advantage of the vast accumulation of research data which you have established. Persistence, plus intelligent action is the thing which your industry and our industry needs now most of all."

I. L. Jones, International Heater Company, explaining why manufacturers and contractors are in the heating business declared it was his opinion that both are in business to make money. The cost of doing business, said Mr. Jones, is a very serious problem of both dealer and manufacturer. Both manufacturer and contractor today must keep accurate track of cost and must know whether the business they are doing is profitable or unprofitable. Accurate accounting systems are essential for both manufacturer and dealer and while the average manufacturer has a complete

cost system, too many contractors neglect this phase of their business. The contractor nowadays must know month by month, even week by week, whether or not, his business is showing a profit. If the contractor does not make money the whole industry suffers accordingly. Mr. Jones suggested that a complete book-keeping system is easy to set up, need not require too much time, and is the only guarantee to present-day profit making.

#### Noise Is a Today's Problem

The research part of the program, as always, indicated investigation directly in line with present-day requirements. Research committee Chairman F. G. Sedgwick pointed out that the research program has been directly responsible for the establishment of new businesses and offered, as an example, the attic fan which was investigated in the research residence and widely publicized and has now established a completely new division of the air conditioning industry.

Professor F. R. Watson, University of Illinois, discussing sound and noise problems in air conditioning systems explained how noise has become such an important factor in everyday living conditions that some cities have undertaken regulations to suppress all noise. Prof. Watson explained how complicated are the analyses of noises in air conditioning and ventilating systems and showed by means of simple experiments how noise can be evaluated, how noise originates and

(Continued on page 113)



# Association ACTIVITIES

## Coming Conventions

1940

June 17-18—American Society of Heating and Ventilating Engineers. Wardman Park Hotel, Washington, D. C. A. V. Hutchinson, Secretary, 51 Madison Ave., New York City.

### Florida

The Roofing and Sheet Metal Contractors Association of Florida is distributing No. 1, Vol. 1 of "The Florida Roofer," published at West Palm Beach and dated May 15.

The monthly bulletin lists officers, gives a word of greeting, followed by convention notes. Later issues will carry articles about the Florida convention. The bulletin is the beginning of a plan to keep the contractors informed as to what is taking place in the state. It is to be published monthly and continued if the members like it.

A plan was proposed at the convention to become affiliated with the National organization, but rejected with the idea that the state association should be strengthened.

The expenses of the publication will be paid from annual dues received from contractors and from manufacturers and supply houses interested directly or indirectly. Annual dues are only \$5.00. Many paid their annual dues at the annual convention. Membership cards are supplied those who have paid.

The 1941 convention city is Jacksonville. Contractors in that vicinity are invited to get together to make the 1941 convention the best yet. Mack Fillingham, president, is a Jacksonville man.

An effort is being made to further reduce insurance rates for Workmen's Compensation in the roofing and sheet metal classifications. Information is being secured in connection with group insurance.

A coupon is provided for members wishing to send in their dues.

L. A. Burgess, Secretary-Treasurer.

### New York State

The Officers and Board of Directors of the New York State Sheet Metal, Roofing & Air Conditioning Contractors' Association, Inc., met at the Onondaga Hotel, Syracuse, on Saturday, May 25th, to hear the reports of the Group Compensation Committees from various sections of the State. Reports of committees were very encouraging. Sums reported from various sections of the state assure the formation of the Group Compensation at a very early date.

George Ballard of Rochester, Henry Steinhorst of Utica, and Clarence J. Meyer of Buffalo were appointed a committee to interview various group managers within the next two weeks and make their recommendations to the State officers and directors at a special meeting to be held in Syracuse within the next thirty days.

The Group Manager selected will be given the list of compensation premiums that the State Compensation Committee has received to date, with orders to proceed with the Group formation.

The selection of any shop outside of Metropolitan New York, to participate in this group will be left to the good judgment of the New York State association's own Compensation Committee. The state association is interested in saving money only for those firms who show that they are using their best efforts to hold down accident claims

by keeping their equipment in first class condition. Shops, who show from experience that they will not co-operate will not be accepted in the group. Shops accepted must show by future experience that they are in keeping with good standards that will be set up for operation. With this set-up in operation, the shops taken into the group can earn dividends up to 50 percent on their present policy.

The New York State association is distributing a Classified advertisers and buyers guide in the form of a wall card, with a suggestion at the bottom that contractors join the New York State group insurance plan and save money. Enclosed with the Guide is a blotter with fifteen reasons why contractors should be a member of the association, and a few facts on what constitutes the cost of doing business—material, labor, expense, and what expense consists of.

Interested parties, in order to get into this Group, must write to Clarence J. Meyer, Secretary, 569 Genesee St., Buffalo.

Clarence J. Meyer, State Secretary.

### Michigan

The Heating and Air Conditioning Division of the Michigan Sheet Metal, Roofing, Heating and Air Conditioning Association, held a meeting Thursday Evening, May 2 at the Hotel Rowe in Grand Rapids. About eighty men from Western Michigan were present. Snow, sleet, and freezing weather in the lakeshore region prevented about twenty-five or more from attending.

Henry Delnay, Chairman of the State, presided, ably assisted by State President, Glen Rynbrand of Kalamazoo, Michigan. Speakers of the evening were Fred Bishop from the Brundage Company, Frank Goward of the Minneapolis-Honeywell Company, and Roland Barlow of the Industrial Training Institute of Chicago.

Comments from those present firmly convinced us of the necessity of holding similar meetings around the State to form a strong organization to try to improve conditions in the heating industry.

Many of the evils that now exist can be eliminated by education in merchandising, cooperation, and faith and trust in one another.

Another meeting of this group will be held in the future to perfect a permanent organization and elect divisional officers and sub-committees.

Meetings of this same nature will be held in Lansing, Saginaw, Kalamazoo, and Detroit as soon as our state secretary, E. C. Spraker, is discharged from Camp Bennington, Georgia.

After a late hour the meeting adjourned to enjoy a lunch provided by the W. C. Hopson Company, Behler-Young Company, Richards Company, and the Grand Rapids Local Heating and Air Conditioning Club.

Henry Delnay, Chairman.

### Chicago Golf Association

The first meeting of the Chicago Furnace Sheet Metal Golf Association, a social organization, met on May 16th at Oak Hills Golf Club. Ten eskimos showed up for the first round.

The group meets for golf and good fellowship two days each month in the Chicago area.

J. Harry Ebbert of The Armstrong Company is president  
D. C. Ellison of Marshall Furnace Company is vice president

Ray J. Lorenz of Chicago Furnace Supply Company is secretary

Grant Wilson of Grant Wilson, Inc., is treasurer.

(Continued on page 98)

# New Products

For your convenience a number has been assigned each item. Circle the items in which you are interested on the coupon on page 96 and mail to us.

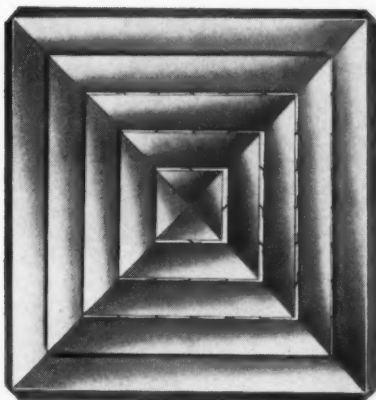
● Indicates product not listed in 1940 Directory.

△ Indicates manufacturer not listed in 1940 Directory.

## ▲83—Agitair Air Devices

Air Devices, Inc., 17 East 42nd St., New York City, offer Agitair air devices.

The Type C Agitair of spun aluminum members masks the duct opening,

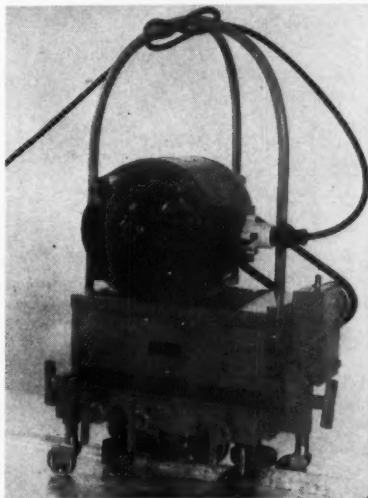


is adjustable to provide control of volume, and velocity, aspiration and turbulence. In combination with lighting units the Agitair harmonizes readily with many types of pendant fixtures.

The Type "R" Agitair temperature equalizer can be supplied in a pattern to fit the space it serves. Custom built for 1, 2, 3 or 4-way air diffusion.

## ▲84—Roof Double-Seamer

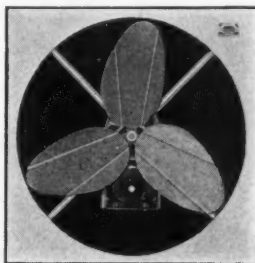
Maxfield Manufacturing Co., 519 South Main St., Temple, Texas, has developed a roofing machine for



forming a standing seam in metal roofs that resists breaks and leaks due to expansion and contraction, and remains water-tight.

## 85—All-Purpose Fan

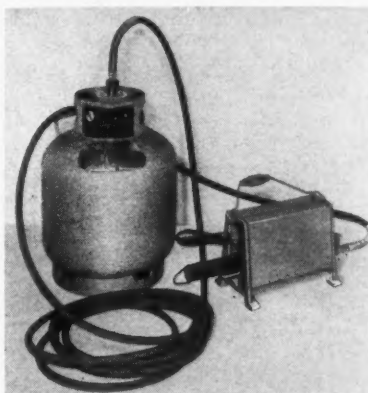
Autovent Fan & Blower Co., 1807 N. Kostner Avenue, Chicago, announces a newly perfected Allvent



(3-blade fan wheel) all purpose ventilating fan with "V" belt drive.

## 86—Soldering Iron Furnace

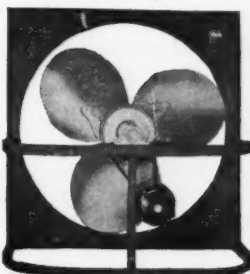
Insto-Gas Corporation, 1900 East Jefferson Ave., Detroit, offers the Insto-Gas soldering iron furnace, used



with a No. 18 cylinder of fuel connected by a 25-foot rubber hose. The furnace is equipped with a bail type handle.

## 87—Frigid Attic Cooler

Circulators & Devices Manufacturing Corp., 100 Prince St., New York



City, announces the Frigid Attic Cooler—with welded steel frames;

rubber mounted, non-radio interfering motors with G-E "Thermotectors"; patented "Quiet" propellers; complete with Randall pillow blocks, pulleys and V-Belt drive. Finished in three-coat gray lacquer. Constructed to mount in pent house, on floor or on window.

## ▲88—Mayn Air Damper

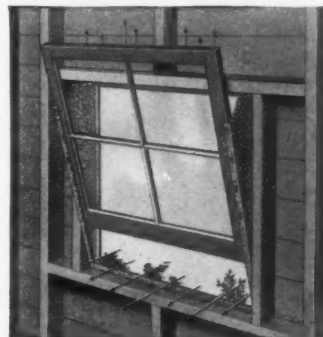
Controlair, Inc., Elyria, Ohio, is manufacturing the Mayn Air Damper for quick balancing of forced warm air and air conditioning systems. The



Mayn Air Damper is located in the throat of a stackhead or register box, positioned so as to point against the air stream, and held in place by means of friction on the damper hinge or by a wiping action of the damper blade with the sides of the stackhead.

## 89—Duo-Vent Metal Frames

Klauer Manufacturing Co., Dubuque, Iowa, announces newly improved Duo-Vent metal frames.



The new D-V sash fastener consists of only two parts and permits a number of sash adjustments, locks securely in position and swings out of the way when raising or completely removing sash.

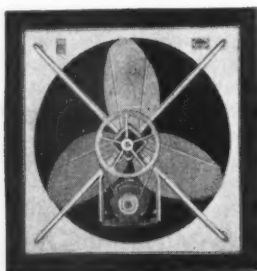


# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 90—Coolvent Attic Fan

Autovent Fan & Blower Co., 1805 N. Kostner Ave., Chicago, announces a further improvement of the Coolvent attic fan. The motor is mounted directly below the fan shaft on a sheet metal pedestal which can be adjusted



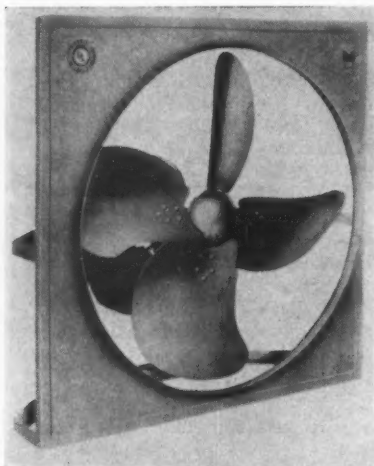
for proper belt tension. The fan is supported by steel tubing welded to a heavy square steel plate. Self-aligning ball bearings are mounted in a new flanged type rubber pillow block.

A low-cost suction chamber and ceiling grill assembly is available.

Fan wheel diameters range from 24 to 54 in. and operate at slow speeds from 281 to 577 rpm. Air capacities vary from 4,070 to 210,000 cfm. The fan wheel is of three-blade design.

## 91—Improved Attic Fan

Chelsea Fan & Blower Co., Inc., 370 W. 15th St., New York City, announces an improved 1940 attic fan. The Chelsea 1940 attic fan is equipped with a new one-piece streamlined venturi orifice. The propeller has been redesigned to operate at a lower speed and is constructed of four die stamped and die



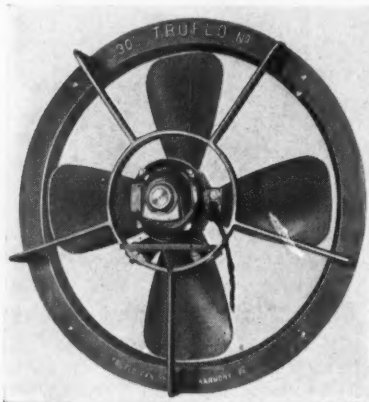
formed blades. Motor is of ball bearing type and specially designed for attic fans. Frame is of high grade steel. The one-piece square panel is reinforced with an angle iron frame having sufficient holes punched in the sides to simplify installation of plenum chamber. The rear assembly is of sturdy

angle iron. Pillow blocks used are rubber mounted, ball bearing.

The Type E fan is furnished in seven models, ranging in air delivery from 5,000 to 25,000 cfm.

## ▲92—Wall Fan Series

The Truflor Fan Company, 503 Main St., Harmony, Pa., announces two series of new wall fans of aluminum alloy construction, ranging in diameters from 12 to 36 in., and 42 to 48 in., and employing four and six blade pro-



pellors, respectively. Motors range from one-fortieth h.p. to seven and one-half h.p. with a maximum capacity of 40,000 cu. ft. of air per minute.

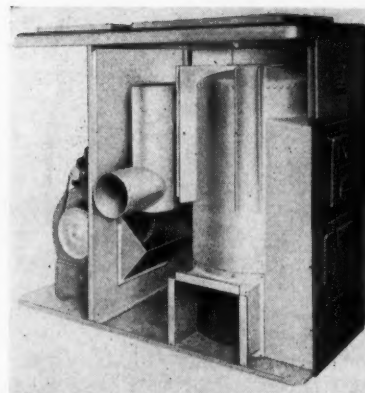
These fans can be supplied with guard and automatic shutters. The frame and the propeller blades are both made of high tensile aluminum alloy, and each is cast in one piece. The wheel is mounted on the motor shaft.

Motors are available for single and variable speeds, and may have horizontal or vertical mountings. Speeds of the larger fans range from 340 to 860 rpm, the smaller from 715 to 1750 rpm.

## 93—Gas-Fired Conditionairs

Delco Appliance Division, General Motors Sales Corporation, Rochester, N. Y., announces three new gas-fired conditioners, a new Delco Model A-12 oil burner, and Delco designed and built controls.

The gas-burning Delco Conditionairs employ a Bunsen Burner type of flame. Air is filtered, warmed, humidified and circulated. Provision has been made for incorporating the Delco summer switch, to provide summer use of the blower and filters. Viscous coated blown glass filters of the throw-away type, and a pan type humidifier with float control are employed. Controls include a thermostat, transformer, regulator, pilotstat, magnetic valve, shut-off valve, and combination control. A furniture steel case finished in Delco-green enamel houses the Conditionair.



## 94—Stoker-Fired Moncrief

The Henry Furnace & Foundry Co., 3473 E. 49th St., Cleveland, announces a stoker-fired Moncrief winter air conditioner, comprising combustion drum with radiator, slow-speed squirrel cage blower, driven by motor mounted on top of housing, four replaceable type filters, and Thermo-Drip automatic humidifier. Overall dimensions are 68 by 34 by 60 in. high.

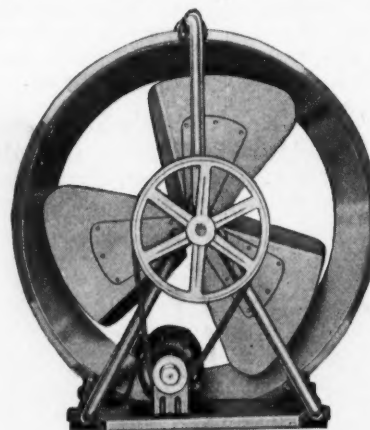
Cabinet is 22-gauge iron, finished in smooth gray crater enamel. Front is cast iron, black crackle finish.

Inner lining forms a dead air space. A metal floor seals the bottom to the cabinet, making it air tight.

## 95—Fresh Air Maker

Schwitzer-Cummins Co., 1128 E. 10th St., Indianapolis, Ind., announces a new low-priced, three-bladed fan—the Fresh-Air Maker.

The Fresh-Air Maker is in response to a demand for low price, quality and performance but is minus a cabinet.



Available with the fan as extra equipment is the discharge shroud, which adds to the fan's quietness and efficiency when installed where static pressure is encountered. Also available are three rubber pads that mount on to the arms of the frame work, to facilitate installation against the wall with a louver used in conjunction with the fan. For floor installation, four rubber feet dissipate noise and vibration.

The 1940 line now consists of three styles of fans, four sizes each, with two motor sizes available for each unit, making a total of 24 fans in all.

# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 96—W59 Thermometer

Minneapolis-Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, has designed especially for air conditioning applications, the new W59A thermometer, incorporating a remote bulb with a mounting clip to permit mounting the operating



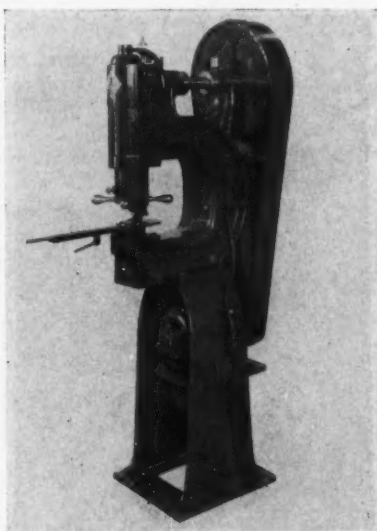
element where it will measure the temperature at the desired point within the duct.

This thermometer is equipped with a universal mounting bracket which allows the face to point to right, left or straight ahead, and also to point at any angle between vertical and horizontal. This feature combined with the wide red liquid column permits temperature readings from a distance of several feet.

Standard range of  $-30$  to  $+180$  deg. F. Finished in polished aluminum.

## 97—Nibbler

W. J. Savage Company, Knoxville, Tenn., has recently added a new machine to their line, with a capacity of 5/16-in. in mild steel. Sheets 24 in.



wide, any length, are handled due to a revolving head feature which permits cutting at any angle on a 360 deg. circle.

New and improved features have recently been added to the line covered by patents Nos. 1,958,941 and 2,182,544.

## 98—Low-Cost Moncrief

The Henry Furnace & Foundry Company of Cleveland, has brought out a new line of square cased gravity furnaces. The cabinet is artistic-



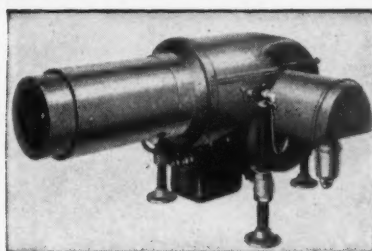
ally proportioned and finished in two-tone smooth green enamel.

Built-in controls with room thermostat assure even heating and Thermo-Drip automatic humidifier produces adequate humidity.

The square casing is supplied with either Series "C" cast, Series "S," "D-40" or "E" steel unit, or Long Life, cast or steel heating unit.

## 99—Spiralaire Oil Burners

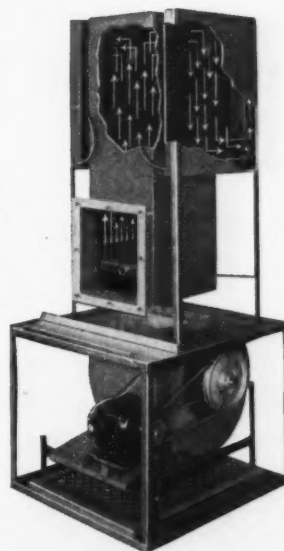
Westinghouse Electric and Manufacturing Co., Home Heating Sales Dept., East Springfield, Mass., announces a new line of three Spiralaire oil burners. When applied to forced warm-air heating systems, the units



are rated at 408,000; 640,000 and 815,000 Btu per hour.

A spiral air stream and a volatile air-oil mixture are combined for complete combustion. A uniform flame is maintained by locating the regulator behind the fan discharge instead of at the fan intake. Volume and velocity of air delivery can be controlled.

Air regulation and an adjustable diffuser permits the flame to be shaped to the firebox. The position and the streamlined design of the air regulator contribute to quiet operation.



## ▲100—Hi-Boy Conditioner

The Dalzen Manufacturing Company, Dept. 100, 511 Leib Street, Detroit, announces a Hi-Boy Model winter air conditioner designed for either gas or oil burners.

The gas-fired unit is equipped with a Dalzen Multi-Tip gas burner. Each tip is a gas burner in itself, supplying at normal pressure, approximately 3000 Btu. input.

The oil burner assemblies offer a choice of two oil burners—one a continuous fire (power pot) hi-lo oil burner, the other a high-pressure gun type oil burner.

The Tropic Breeze Hi-Boy is a compact unit, delivered as a complete packaged product. It will pass through a 28 in. door.

## 101—Standard 20 Line

Iron Fireman Manufacturing Co., 3170 W. 106th St., Cleveland, and Portland, Oregon, announces the "Standard 20" line of Iron Fireman stokers for small homes.

The "Standard 20" stokers are made both in the coal-flow bin type and in the hopper type. Nominal coal feed is 20 pounds per hour Hopper ca-



capacity is 300 pounds of average weight coal.

The feed worm, rolled from bar steel, has a stainless steel tip for resistance to heat and acid corrosion. An intermittent type transmission is used, with three speeds and a neutral. Motor is of 1/4 h. p. The stoker is equipped with a quiet radial vane fan.



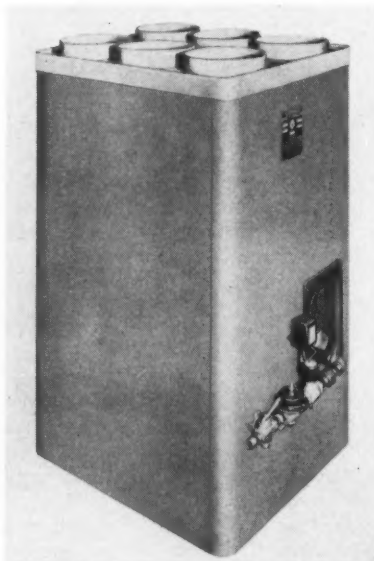
# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 102—Gravity Gas Heater

Conco Corporation, Mendota, Ill., offers an automatic gas-fired gravity heater in sizes to cover both domestic and semi-commercial installations. The unit leaves the factory completely assembled and wired.

The cabinet is streamlined. The heating element is formed from heavy

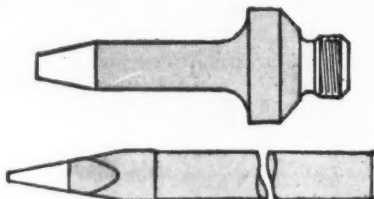


pressed steel sections, welded into a single piece. Two insulating inner liners protect against heat loss. The unit is equipped with an improved type multiple tubular burner. Other features included: thermostatic control, a pressure regulator which maintains a constant input of gas despite fluctuations in the line, and an "automatic pilot" which protects against operation of the heater if the pilot light should become extinguished.

## 103—Soldering Iron Tips

Stanley Tools, New Britain, Conn., announces a new line of Armor Clad soldering tips for their screw tip and plug tip electric soldering irons.

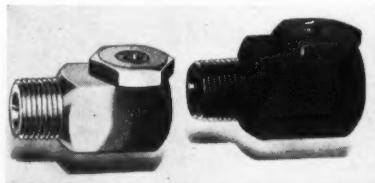
The Armor clad tip is a copper tip with a thin special metal coating, thus



retaining the high heat conducting value of copper and at the same time eliminating the rapid oxidation and corrosion formerly experienced. The Armor clad tip is readily tinned. Retinning is also less frequent.

## 104—Whirljet

Spraying Systems Co., 4021-F W. Lake St., Chicago, announces a new corrosion resistant nozzle—the Whirljet non-clogging spray nozzle—avail-

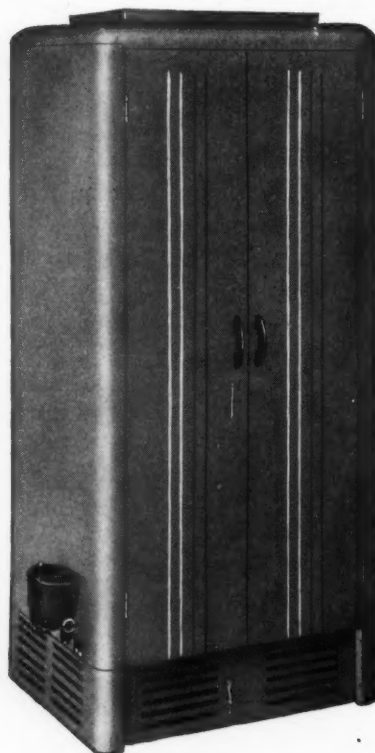


able in brass, all iron, hardened steel, stainless steel, monel metal, lead, hard rubber, and other material as required.

Nozzles produce a hollow cone spray.

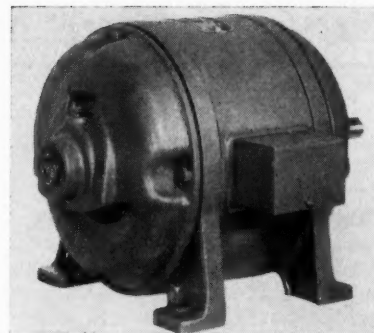
## ▲105—Par-Exc

Interstate Metal Products Co., Inc., 4401 Ogden Ave., Chicago, is offering the Par-Exc modern oil-fired heating plant with a maximum Btu input of



85,000, for Model 70, suitable for the home, store, office, restaurant, etc.—basement or heater room installation. Housed in a streamlined, steel cabinet in crackle finish.

Parts include steel welded combustion chamber, double cabinet wall, vapor type burner pot, sealed air intake to burner, thrust bearing motor and forced air fan, forced air distributing baffle, outlet to flue pipe, hot air chamber, down draft chamber and hot air outlet.



## 106—Capacitor Motors

The General Electric Company, 1 River Rd., Schenectady, N. Y., announces an extension of its line of capacitor-motors for refrigeration and air-conditioning service. This line of motors, which previously included ratings from  $\frac{1}{8}$  to  $\frac{3}{4}$  hp, has now been extended to 3 hp inclusive.

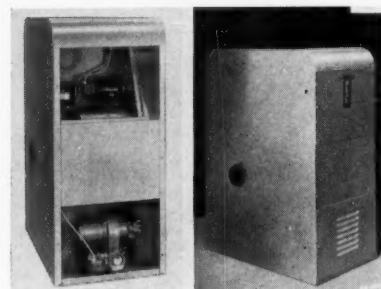
Fundamentally, a capacitor-motor is a single-phase motor that obtains starting and pull-up torque by the use of two stator windings and a capacitor. It consists of only five electrical parts: a cast-aluminum rotor, a starting winding and a running winding, a centrifugally operated switch, and a capacitor.

The starting and running characteristics of capacitor-motors are well suited to air-conditioning and refrigeration service. They develop the high-starting torque required for these applications, and also have a high efficiency which means low power costs. Capacitor-motors are quiet in operation, requiring oiling only at infrequent intervals, and because they have neither brushes nor commutator do not interfere with radio reception and require little maintenance.

## 107—F-80 Activ-Air Unit

The Heil Co., 3000 W. Montana St., Milwaukee, Wis., is turning out a new oil burning, direct-fired air conditioning unit, completely assembled.

The Heil F-80 Activ-Air condition-



ing unit requires only electrical wiring and oil line connections.

The complete unit consists of an all-welded steel furnace, blower, filter, and Heil Activ-Flameoil burner. The unit is rated at 80,000 Btu.

The unit, encased in a steel jacket, occupies a floor space 26 x 43 inches and stands 57 inches high.

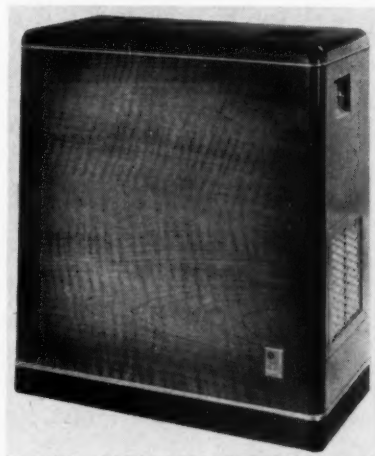
# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 108—Ventilators and Coolers

National Standard Air Products Company, 325 West Huron St., Chicago, Illinois, has a line of Airmode room coolers, electric window ventilators, exhaust ventilators, attic cooling systems and air circulators.

The Airmode room cooler, mounted on rubber tired casters, is moved into



the room, placed at the window, and plugged into the nearest electric outlet, to provide cooled, filtered, dehumidified and circulated air, constantly freshened by a small supply of fresh filtered outdoor air. Or, an exhaust of stale room air is provided as needed.

Airmode electric window ventilators (motor, controls, fans, filter, with grille openings) supply fresh outside air in any volume up to 500 cfm without drafts and displaces stagnant room air, creates a gentle movement of freely circulating air directed toward the ceiling, or the room air may be kept in motion with any desired amount of outside air mixed through operation of an outside damper.

## 109—Room Humid-U-Stat

Minneapolis-Honeywell Regulator Company, 2950 Fourth Avenue South, Minneapolis, has designed to conform with the trend in modern architecture and finished in silver bronze a new

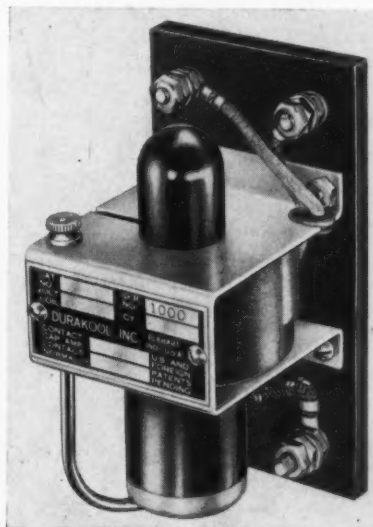


H0900 room Humid-U-Stat—a pneumatic hair element humidity controller designed for wall mounting.

The instrument is available in the scale range of 20 to 80 percent relative humidity with scale markings 20, 50 and 80. The throttling range is adjustable from 2 to 30 percent relative humidity.

## •110—Unbreakable Relay

Durakool, Incorporated, Elkhart, Indiana, announces the Durakool mercury relay, which utilizes the unbreakable metal body of the Durakool mercury switch and the displacement principle with solenoid actuation.

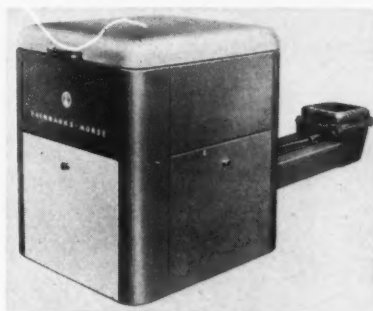


The contact structure is hermetically sealed, the durable metal body is specially treated to hold a gas at a pressure of 4 atmospheres.

## ♦ 111—1940 Fairbanks Stokers

Fairbanks, Morse & Co., 600 S. Michigan Avenue, Chicago, discloses numerous mechanical features of their 1940 stoker models:

The Stok-o-lite, located on the thermostat, is an automatic indicator which produces a warning light if the stoker fails to function properly.

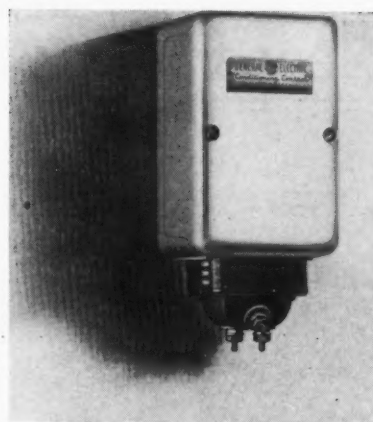


The Magic Dial synchronizes heat input with heat losses.

The Fire-Trol automatically regulates the amount of air supplied to the fuel bed.

Hammerloid finish in two colors—red and gold—is used.

Other features on the home bituminous models include a retort design which has proved successful on the commercial models, an overload release which assures operating safety and a quiet all-spur gear case.



## 112—Stoker Control Relay

General Electric Company, 1 River Road, Schenectady, N. Y., announces a new relay for controlling a stoker in conjunction with time switch, limit controls, and room thermostat.

Six terminals on convenient terminal block provide means for line, load, and limit control connections, without the use of a connection box. There are three conduit openings for interconnecting with other controls.

## ♦ 113—Nome Coolers

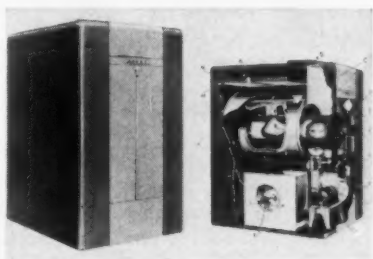
Bien Air Conditioning Company, 1620 N. Spring St., Los Angeles, announces the new Nome portable, a self-contained package cooler.

Model 19CP cools, filters and washes the air, recirculating the water without a pump. The unit is placed on a window sill and plugged into a light socket.

## 114—Oil-Burning Fastemps

Norge Heating and Conditioning Div., Borg-Warner Corporation, 670 E. Woodbridge St., Detroit, is launching a program to provide heat and air conditioning at low cost for homes in the \$2,000 to \$9,000 group.

President Howard E. Blood states that four units, new in design and construction, range in size from a



small "below the floor" installation which requires no basement, to a completely automatic full-sized pressure-type oil furnace with electric ignition, air filter and humidifier. All are of the oil-burning warm air type. An alternate model of the largest unit is designed to burn gas.

The three smaller Fastemp models are designed for homes in the \$2,000 to \$6,000 price range, requiring a heat output of between 40,000 and 63,000-Btu. Model 120, finished in two-tone lacquer, has been designed for homes costing up to \$9,000 which require between 85,000 and 120,000 Btu.



# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 115—Magnetic Gas Valves

Julien P. Friez & Sons, 4 N. Central Ave., Baltimore, Md., announce a series of single-port magnetic gas valves in four sizes:  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$  in.

These are expressly developed for the control of floor furnaces, gas hu-



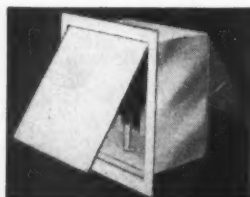
midifiers, safety pilots, or the control of diaphragm valves.

Operation is by flapper type armature. Valve port has metal to metal ground face, with self-adjusting valve made of Monel. Internal parts are electrically tinned against corrosion.

Valves can be supplied in line voltage (110 V.) or low voltage (20 V.).

## 116—Kitchen Fan

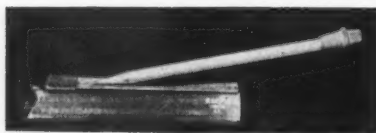
The Autovent Fan & Blower Co., 1823 N. Kostner Ave., Chicago, announces a new development in kitchen ventilation, featuring remote control



and self-operating doors, finished in rust-resisting aluminum. The fan, in one standard size, is constructed with an adjustable sleeve adaptable to any wall thickness. Inside door and frame are enameled white. Motor operated doors close when the fan is turned off.

## 117—Ralpo Pencil Pointers

Ralph W. Poe, Canton, Illinois, is manufacturing the Ralpo pencil point-



ers and is perfecting the production equipment to make these pointers at a lower cost. Mr. Poe is also designing a pocket model.

## 118—Oil Lubricated Motor

U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles, Cal., has developed an oil lubrication system which is now being supplied on all open type SA and Uniclosed type SC motors larger than 30 h.p., 3600 rpm, and 75 h.p. 1800 rpm.

A conveniently located and simply constructed oil gauge is supplied on all oil lubricated motors.

## 119—Colaweld Metal Joiner

Colonial Alloys Company, E. Somerset, Trenton Ave. & Martha Sts., Philadelphia, announces Colaweld Metaljoiner for the joining of aluminum or aluminum alloys to each other or to other metals, as well as the joining

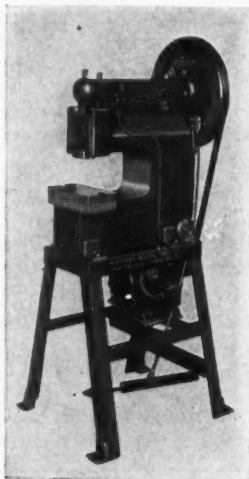


of steel, copper, brass, monel metal, stainless steel, zinc, tin, silver, etc.

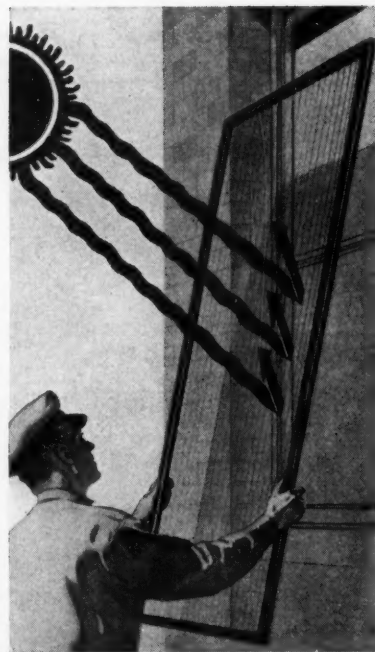
Application consists of applying Colaweld Metaljoiner in powder form or in paste form (powder mixed with water) to the surfaces of the metals to be joined, then placing the metals together and applying heat, or the heat may be applied to the metal joint first.

## 120—Power Press No. 129

The Whitney Metal Tool Co., Rockford, Ill., has recently introduced the Whitney-Jensen heavy duty power press No. 129.



This machine has a throat depth of 12 in. and a capacity of 5 ton.



## 121—Koolshade Sun Screen

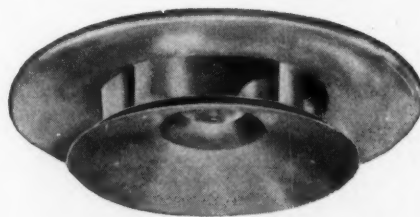
Ingersoll Steel & Disc Div., Borg-Warner Corp., 310 S. Michigan Avenue, Chicago, offers Koolshade Sun Screen—a fine metal fabric.

Koolshade sun screen is likened to a miniature Venetian blind with slats made of flat wire as narrow as a pencil lead and paper thin. Vertical wires spaced one-half inch apart hold the flat horizontals at a fixed angle, calculated to shut out direct sun radiation. The fabric is made of a fine-grade bronze. Framing and installation is the same as for ordinary full length fly screens. A 12-page booklet, illustrating and describing the Koolshade, is available.

## 122—Air Distributor

Charles Demuth & Sons, 112-07 New York Boulevard, Jamaica, N. Y., offers the Demuth air distributor, a ceiling fixture, for both heating and cooling installations.

The distributor may be used in conjunction with lighting fixtures.

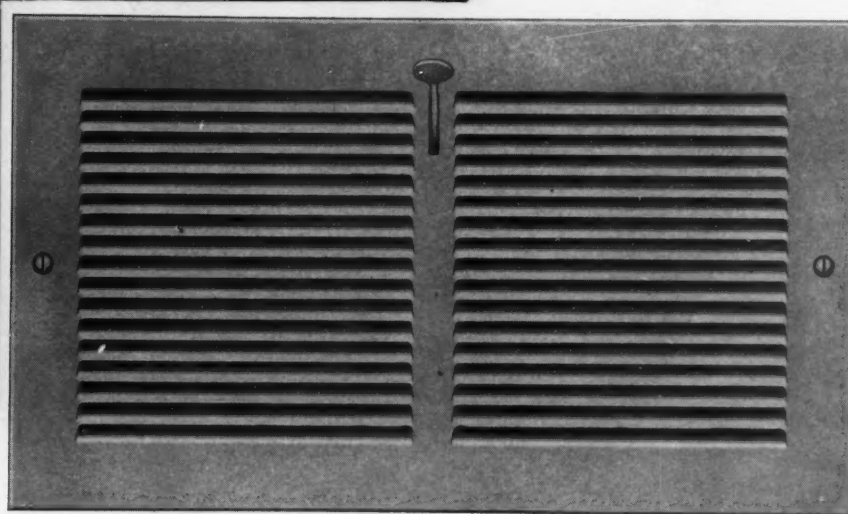


A ceiling flange slips into the duct connection. A deflecting cone is mounted co-axially and spaced from the flange, thereby forming an emitting nozzle. Within this nozzle opening are placed curved deflecting vanes. A second hollow deflecting cone, which extends beyond the edge of the principal cone, is spaced from the principal cone and forms a tangential injector nozzle.

Polished aluminum, Satin aluminum or enamel finishes are available.

# Auer AIRO-FLEX DIRECTIONAL Register "7000" SERIES New ECONOMY in an ADJUSTABLE REGISTER!

The Finest  
LOW-PRICED REGISTER  
on the Market!



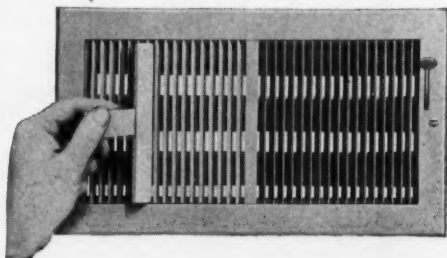
If you want a *first quality* air conditioning register that doesn't cost too much, one that is *adjustable* for directional flow—try this new Auer Airo-Flex "7000".

This Airo-Flex gives you simple, practical downward flow control. Grille bars are set at the factory for  $22\frac{1}{2}^\circ$  downward deflection, but are easily adjustable for other angles. The "7000" Registers are equipped with single louvre. Also furnished in wall and baseboard types for intakes.

A strong, well made register, without complicated mechanism, this model is exceptionally easy to install and highly adaptable to air conditioning needs. Widely admired for its attractive appearance, the "7000" looks like a register that costs *much more*.

See it at your supply house. If you haven't received new complete Auer Register Book 40—let us know and your copy will be sent.

Airo-Flex is also made in the "4000" Series with vertical bar grille and multiple louvre. Method of adjustment of grille bars shown below.

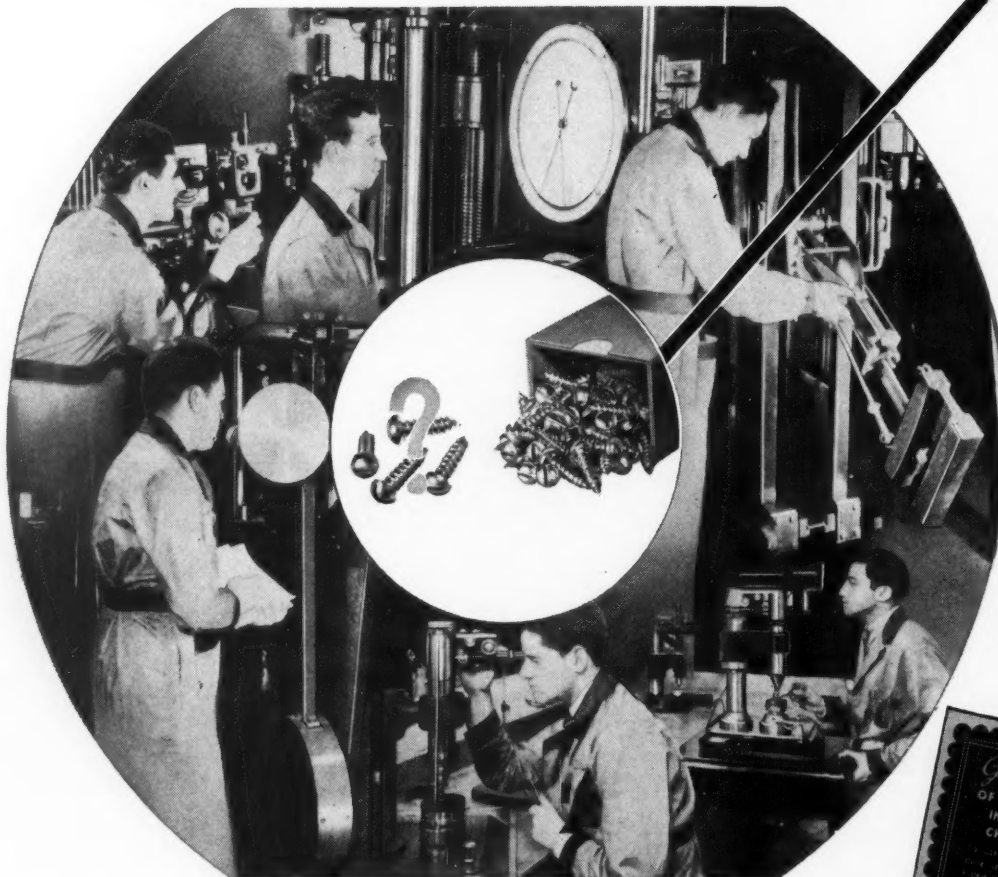


THE AUER REGISTER COMPANY, 3608 PAYNE AVENUE, CLEVELAND, OHIO

**AUER** DISTINCTIVE **REGISTERS**  
& GRILLES  For Air Conditioning *and Gravity*



# *NO "Doubtful Few"* CAN SLIP THROUGH



## **Parker-Kalon's unique Quality-Control Laboratory rules out "doubtful" screws that threaten fastening jobs**

PUT Parker-Kalon Fastening Devices on your assembly line and you'll end troubles with the "Doubtful Few" ... those few imperfect units in a box that won't drive properly or make satisfactory fastenings. Such screws are ruled out by Parker-Kalon's scientific "3rd degree" of tests and inspections.

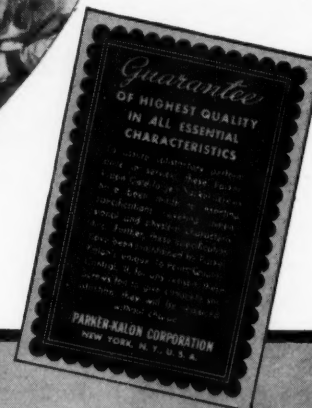
A \$250,000 Quality-Control Laboratory that has no counterpart in the industry has made it possible to

hold Parker-Kalon Hardened Self-tapping Screws, Socket Screws, and other fastening devices to higher standards than ever before could be attained. Precision equipment controls every step in production. "Doubtful" units *can't* slip through!

Specify PARKER-KALON on your next order ... get fastening devices guaranteed by the most modern plant in the screw industry. Parker-Kalon Corp., 190-192 Varick St., New York.

**SOLD ONLY THROUGH RECOGNIZED DISTRIBUTORS**

*Quality-Controlled* **PARKER-KALON**  
**Fastening Devices**

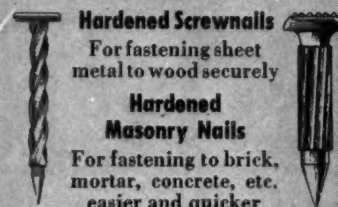


**COSTS NO MORE** to get  
this Parker-Kalon Quality-Control  
Guarantee with every box of ....



### **Hardened Self-tapping Sheet Metal Screws**

Sizes and head styles for assembling light and heavy sheet metal



### **Hardened Screwnails**

For fastening sheet metal to wood securely

### **Hardened Masonry Nails**

For fastening to brick, mortar, concrete, etc. easier and quicker

## New Literature . . .

For your convenience in obtaining copies of new Literature use the coupon on page 96

### 165—Dust Control in Word and Picture

American Air Filter Company, Inc., First and Central Avenue, Louisville, Ky., is distributing a story of Roto-Cone dust control in word and picture.

### 166—Agitair Data Sheet

Air Devices, Inc., 17 E. 42nd St., New York City, offers Type "C" Agitair Data Sheet No. 1 for the answers to your air distribution problems.

### 167—Micheli Multi-Zone Conditioner

Micheli Air Conditioning Co., Inc., 1725 State Street, Schenectady, N. Y., is distributing a 4-page folder covering their Multi-Zone Conditioner—heating, humidifying plus cooling for summer, with thermostat control.

### 168—Melo-Air Comfort

Agricola Furnace Company, Inc., Gadsden, Alabama, is distributing a 4-page circular covering their Melo-Air furnaces, with specifications. Capacities range from 69,000 to 160,980 Btu at the register.

### 169—Electrolaire Warm Air Conditioner

Electrol Incorporated, 934 Main Avenue, Clifton, N. J., is distributing a folder covering the Electrolaire warm air conditioner—a complete unit for the small home which heats, humidifies, filters and circulates. Btu per hour at the bonnet—85,000 and 100,000.

### 170—Motor Application Chart

Leland Electric Company, Dayton, Ohio, is distributing a 4-page motor application chart—Section 1203—for their repulsion start induction, split phase, capacitor start induction, polyphase, direct current, explosion proof, adjustable speed motors, generators and converters.

### 171—Furnace Literature

The May-Fieberger Company, Newark, Ohio, is distributing six pieces of literature:

"Over Fifty Years of Heating Service," covering the Akron Air Blast Furnace  
Comfort—The Aristocrat of Steel Furnaces  
The New Comfort Steel Furnace  
The New Comfort Gas Fired Air Conditioning Unit  
Ath●A●Nor—the Original Smokeless Furnace  
Ath●A●Nor DeLuxe Furnace

### 172—Registers & Grilles

Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn, N. Y., is distributing Catalog No. 8—48 pages and cover, indexed—covering their registers and grilles. General definitions and specifications precede the illustrated descriptions of the various products. The catalog goes into detail regarding all types of registers and grilles.

### 173—Exhaust and Ventilating Fans

The Emerson Electric Mfg. Company, 1824 Washington, St. Louis, has published a 16-page catalog X3659 entitled "Emerson-Electric Ventilating and Exhaust Fans."

The booklet illustrates and describes exhaust fans, shutters and protective mesh guards, kitchen ventilating equipment and Seabreeze kitchen ventilators. Information, dimensions, performance and prices are included.

### 174—Circulating Heater, Fans and Awnings

The Snoair Co., 1904 Field St., Dallas, Texas, is distributing three circulars:

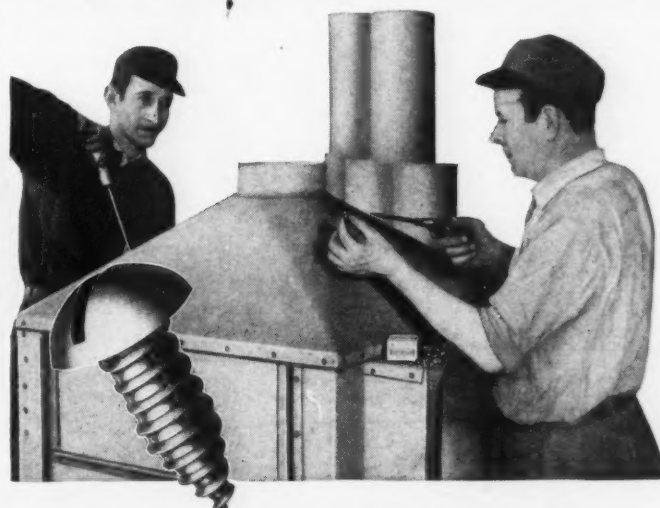
The new Snoair circulating heater, requiring only a gas connection and an electric outlet.

The Snoair attic and window fans.

Snoair Venetian awnings (awnings and venetian blinds in one).

## "SURE MAKE SWELL JOBS . . .

and no 'doubtful' screws to slow us down!"



### Good tinsmiths use Parker-Kalon Screws for better work, bigger profits!

Don't cut your profit on a job by using "doubtful" screws...screws that look okay but actually break, strip, start crooked or fail to draw up tight. Screws like these make jobs slower...harder...and far more costly. Avoid "doubtful" screws. Stick to genuine Parker-Kalon Sheet Metal Screws...40,000 shops use them day in and day out for better fastenings.

Behind the consistently fine quality of Parker-Kalon Sheet Metal Screws lie three important factors. These Screws are backed by over 25 years' experience in Screw manufacture...they are made to rigid standards on specially developed equipment...and are Quality-Controlled at every step by Parker-Kalon's \$250,000 Research Laboratory. For better jobs at a better profit...insist on genuine Parker-Kalon Screws! For free samples write: Parker-Kalon Corp., 190-192 Varick St., New York.





# New Products . . . . .

For your convenience in obtaining information regarding these items, use coupon on page 96.

## 123—205-VDA Spot Welder

The Eisler Engineering Company of 740-770 S. 13th St., Newark, N. J., has introduced a 5 KVA high speed production spot welder. This welder is an air operated, vertical press type machine supplied with a suitable automatic timer and contactor.

There are two operators for this welder, one to load the welding fixture and the other to operate the foot switch and slide the fixture along after each weld.



## 124—Colalloy 301 Alloy

The Colonial Alloys Company, E. Somerset, Trenton Avenue and Martha St., Philadelphia, is now offering their No. 301 alloy, a light weight, rust-proof alloy with high strengths, good forming and drawing qualities.

Colalloy No. 301 lends itself to gas welding, spot welding, seam welding, arc welding, brazing, soldering, Colawelding (fusion welding chemically) and reaction soldering.

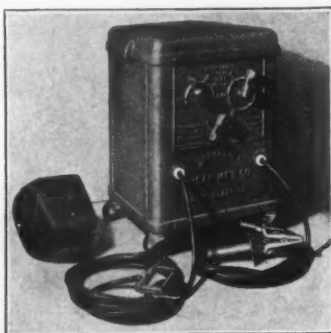
The metal polishes, is non-magnetic and non-sparking, and is approximately 66 percent lighter than steel or iron and 70 percent lighter than brass, copper, nickel, or bronze.

The alloy can be furnished in sheet, plate, rod, bar, wire, pipe, tubing, extruded forms, etc.

Test samples are available.

## 125—Arcmaster Welder

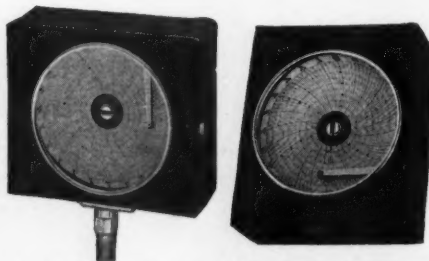
Bear Mfg. Co., Rock Island, Ill., announces a new A. C. Arcmaster welder featuring a multiple coil trans-



former design, with reactance control, that enables an operator to strike and hold a steady arc with any size rod. The Arcmaster is built for heavy duty operating conditions.

## 126—Miniature Recorders

Jas. P. Marsh Corporation, 2073 Southport Ave., Chicago, announces a new line of Marsh miniature recorders for temperature, pressure, cycle

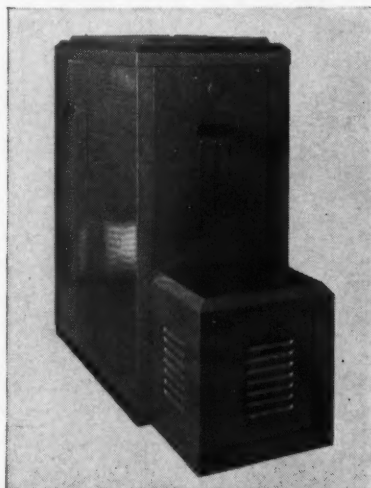


operation and humidity. They measure 5 x 6 x 2 1/4 inches and are extremely light in weight.

A simple screw adjustment follows the idea of the Marsh recalibrator. An accurate, fully adjustable clock movement rotates the charts.

## 127—Oil-fired Conditioner

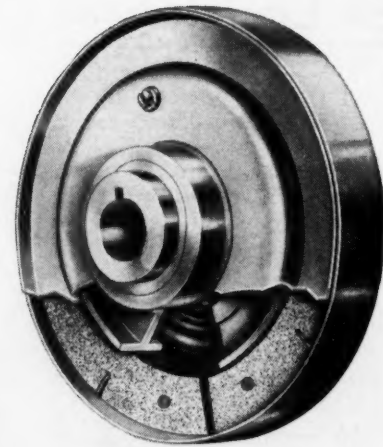
Westinghouse Electric & Manufacturing Co., East Springfield, Mass., announces a new small-capacity oil-fired winter air conditioning unit.



The new OAK oil-fired air conditioner has a steel combustion chamber and is fired by the Westinghouse Spiralaire oil burner. The unit is 28 in. wide, by 66 in. by 56 1/2 in. height.

## 128—Automatic Humidifier

The Badger Mfg. & Sales Co., 743 North Fourth St., Milwaukee, announces a new automatic humidifier consisting of a stainless steel evaporating pan, equipped with an adjustable float and automatic valve. The chamber containing the float and valve assembly is made of cast Balco metal. Twelve evaporator plates and rack are available for forced air jobs with low bonnet temperature.



## 129—Clutch

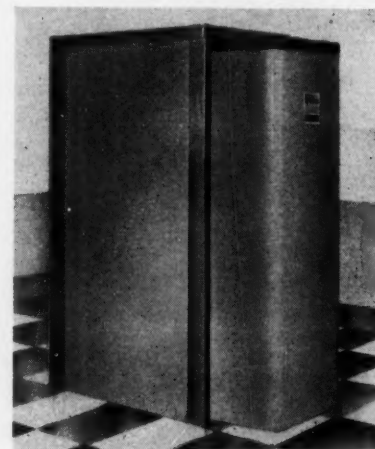
Mercury Clutch Corporation, 637 West Third St., Massillon, Ohio, has developed the new Mercury clutch which permits a driving motor to gain speed before assuming load. Utilizing mercury to displace friction segments by centrifugal force, the clutch gradually picks up the load at full speed. Smaller motors may be used when starting under load.

Four principal parts comprise the clutch—the driving member or housing, the driven member or inner drum, the clutch segments and the mercury, the latter being introduced or removed through filler holes.

At present, 4 and 4 1/2-inch diameter sizes are standard, and transmit loads up to 5 h. p.

## 130—Sun Fuel Miser

J. V. Patten Company, Sycamore, Illinois, announces a new line of oil-fired automatic furnaces. Designed primarily for the low-cost housing program, the Sun Fuel-Miser is built in three sizes to deliver 80,000, 125,000 and 165,000 Btu per hour—equipped with pressure atomizing standard oil burners.



Each size is built in two types—a horizontal contra-flow type for basement installation and a vertical type with top mounted blowers for space heating and utility room installations.

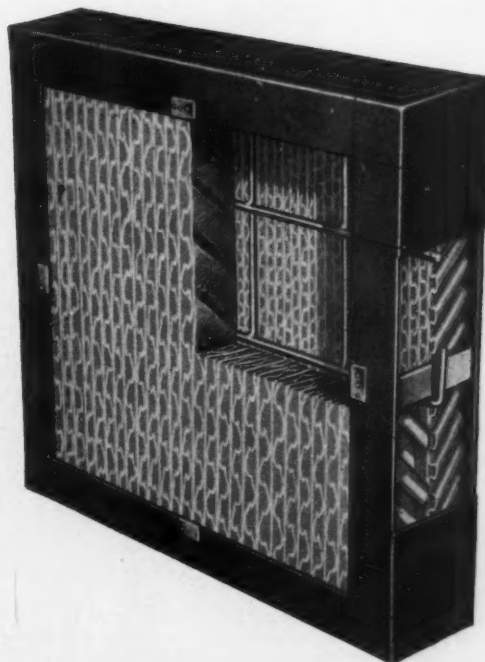
The Patten company claims patent rights on a new design of blower scroll which is directional at the scroll outlet.

## Eleven Good Reasons For Using DETROIT AIR FILTERS

(Formerly the Arco Air Filter)

1. Exceptional cleaning efficiency—90% dust removal.
2. Economy—service life is long—costs less than many filters, no more than others.
3. Initial efficiency retained longer than in other filters.
4. Very low air resistance—no spot clogging.
5. High dust capacity, hence longer service life.
6. May be used in any position—will not warp or sag.
7. Rigid construction—does not pull apart when removed for replacement.
8. No particles of adhesive or filter material can be picked up by the air stream.
9. Odorless—and remains tacky at 10°—will not drip at 180°.
10. Air stream leaving the filter may be directed by the filter itself.
11. Serves as an effective sound deadener.

The Detroit Air Filter is made of two 45° cross section slices of corrugated board, placed together so air passing through must make a right angle turn. The dust catching fluid, impregnated in the fiber, grabs the dust as it goes by. • Write for descriptive bulletin.



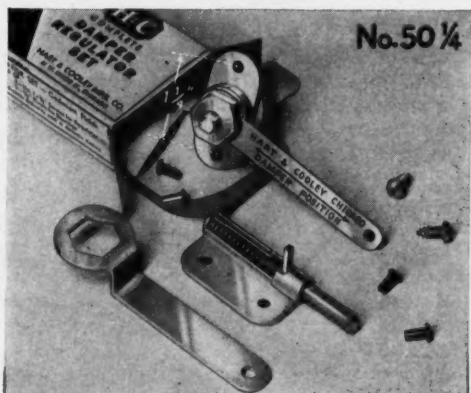
**DETROIT LUBRICATOR COMPANY**

General Offices: DETROIT, MICHIGAN

Canadian Representatives: RAILWAY AND ENGINEERING SPECIALTIES LIMITED  
Montreal • Toronto • Winnipeg



**ECONOMY TYPE** *Quality at a Price!*  
Furnished with both wing and hex lock nuts.  
Made only with 1/4" Bearings. No. 40 1/4—List Price 30c Set  
May also be had with snap end bearing.  
No. 40 1/4 S—List Price 32c Set



## H&C DAMPER REGULATOR SETS

*Pick the Type that Suits you Best!*

H&C offers four different sets, three of which, in the 1/4" size, are furnished with snap end bearing to permit the installation of even the smallest dampers without bending. All are quality sets in every detail with all parts rust-proofed; all are equally adaptable to splitter or regular dampers. See your Jobber or write for sample and descriptive literature.

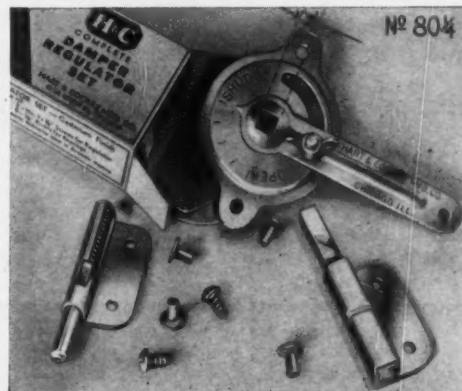
**HART & COOLEY MANUFACTURING CO.**  
HOLLAND, MICHIGAN - - Chicago Office at 61 W. Kinzie Street

### BRACKET TYPE (left)

With 1/4" Bearings—No. 50 1/4  
—List Price 40c Set  
With 3/8" Bearings—No. 50 3/8  
—List Price 60c Set  
1/4" size has snap end bearing.

### DISK TYPE (right)

With 1/4" Bearings—No. 80 1/4  
—List Price 40c Set  
With 3/8" Bearings—No. 80 3/8  
—List Price 60c Set  
1/4" size has snap end bearing.





Fire Pot Diam.	Bonnet Output BTU's	Evaporating Capacity Required			
		Gravity — Or Forced Air If Weatherstripped		Forced Air If Not Weatherstripped	
20"	72000	400	8	800	16
22"	90000	500		1000	20
24"	108000	600	12	1200	24
26"	126000	700		1400	28
28"	144000	800	16	1600	32
29"	162000	900		1800	36
31"	180000	1000	20	2000	40
34"	216000	1200	24	2400	48
	252000	1400	28	2800	56
	288000	1600	32	3200	64
	324000	1800	36	3600	72
Coal Hand Fired	Oil, Gas, or Stoker Fired	Sq. Ins. Water Surface	Number of Plates	Sq. Ins. Water Surface	Number of Plates

## MONMOUTH Speedy Capacity Finder Revolutionizes Humidification

Good-by to guesswork. You can now instantly select the correct size humidifier for any application.

A mere glance at the table and you have the right answer—and you can bank on it's being right.

This marks the first time that any humidifier manufacturer has placed capacity specifications on a scientific basis. It is the cumulative result of many years' research plus experience under every conceivable condition of service.

No longer need you guess, cross your fingers and hope you are installing the right size humidifier. *Now you can be sure!*

Write today for your copy of the capacity finder with complete instructions.

**MONMOUTH PRODUCTS CO.**  
1933 E. 61st St. Cleveland, Ohio

**MONMOUTH**  
*The Greatest Name in Humidification*

## New Literature

For your convenience in obtaining copies of new Literature use the coupon on page 96

### 175—Steel Stock List

Joseph T. Ryerson & Son, Inc., 16th & Rockwell Sts., Chicago, is distributing their 1940-41 Certified Quality steel stock list—indexed—for immediate shipment.

### 176—Fans—Wall, Pent House and Roof

Truflo Fan Company, Harmony, Pa., is distributing a 4-page folder covering their wall fans, pent house fans and roof ventilating fans.

### 177—Air Conditioning Supplies

Airo Supply Company, 2732 N. Ashland Ave., Chicago, announces their 1940 Catalog and Buyers' Guide of Refrigeration and Air Conditioning Parts, Tools, Supplies and Shop Equipment—96 pages with list prices.

### 178—Metal Mouldings

Alden Manufacturing Co., Panesville, Ohio, is distributing Catalog No. 58 entitled "Metal Mouldings"—corner pieces, insert mouldings, snap-on mouldings, stainless steel mouldings, stair nosings, bindings and edgings.

### 179—Lockformer "24" Circular

The Lockformer Company, 4615 Arthington St., Chicago, is distributing a four-page illustrated circular giving complete specifications and prices on the new Lockformer "24" and the new power flanger attachment.

### 180—RH Furnaces and Conditioners

The Rybolt Heater Company, Ashland, Ohio, is distributing three new folders—"Steel Coal-Fired Winter Air Conditioner Series 4200;" "Steel Furnace Series 4000;" and "Cast Iron Gas-Fired Winter Air Conditioner." Each folder carries specifications and capacities.

### 181—Insulation for Air Conditioning, Heating

Grant Wilson, Inc., 4101 W. Taylor St., Chicago, is distributing a list of insulation materials for plumbing, air conditioning and heating—illustrated and described. Attached to the list is "A Very Private Memo. of My Convention Trip."

### 182—Pressure, Flow and Temperature Controls

General Controls Co., 700 W. Ivy St., Glendale, Cal., has just issued a 48-page catalog of the entire line of pressure, flow and temperature controls—illustrated and described. In addition, complete application, engineering and installation information is offered covering each item.

### 183—Stack Cutting Economies and Welding

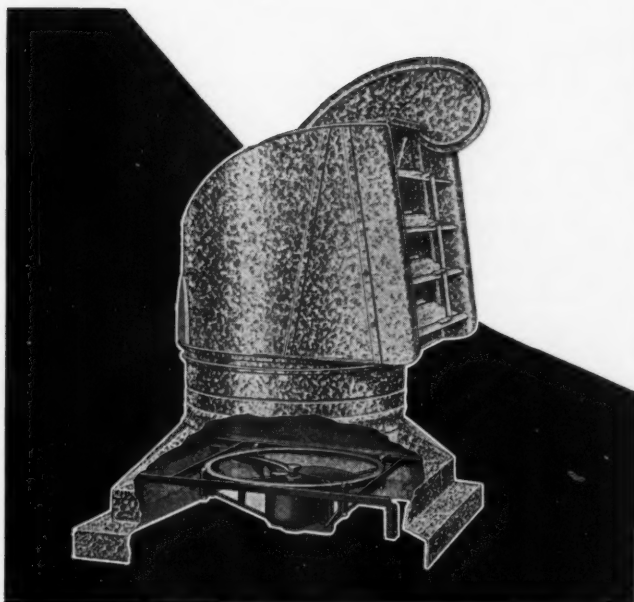
The Linde Air Products Company, 30 E. 42nd St., New York City, is distributing the June issue of Oxy-Acetylene Tips containing an article on "Stack-Cutting Economies" and the second "Instruction Outline for Welding Steel Sheet and Plate."

### 184—Soldering Tools, Transformers, Etc.

Ideal Commutator Dresser Co., 1253 Park Ave., Sycamore, Illinois, is distributing literature covering their "Automatic" motor base, Thermo-Grip tools for all kinds of soft soldering, Instant Heat electric solderer, joist boring machine, wire connectors, transformers, etc.

### 185—Employee Service Record

Young Radiator Company, Racine, Wisconsin, manufacturers of heating, cooling and air conditioning equipment, is distributing Reading Notice No. 101 entitled "Time Moves On at Young's," which graphically presents the service record of its 357 employees. 15 percent of the employees has been with the company for more than ten years, while another thirty percent has served for periods of between 5 and 10 years. F. M. Young is president of the company.



Keep Ventilating Dollars  
*Coming Your Way*  
with the

## Swartwout AIRJECTOR

Name Registered U.S. Patent Office

Now that the "Business is Better" sign hangs in construction company offices you can cash in on hundreds of profitable ventilating jobs. Here's where the Swartwout Airjector helps you to give customers a better job that is a credit to your reputation.

The Airjector is the last word in roof ventilation—rotary type plus power and used either with power or without as conditions require. Discharge is always with the wind, eliminating static resistance. Airplane type propeller fan provides greater capacity for power consumed—economical to operate, low up-keep cost.

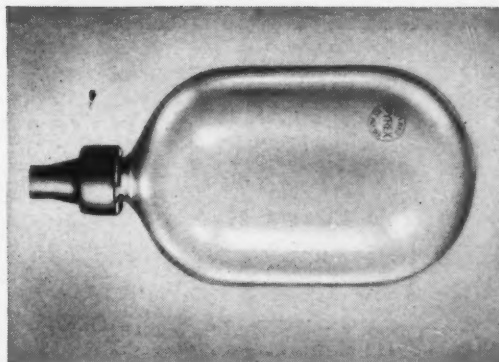
Make ventilating dollars come your way—show the superior features of Swartwout Ventilators. You can handle all requirements with Airjector, Swartwout Rotary and Swartwout-Dexter Heat Valve. Write today for complete data, prices and discounts.

**THE SWARTWOUT COMPANY**  
18615 Euclid Ave. Cleveland, Ohio

# Swartwout

**VENTILATION SPECIALISTS**

## NEW! IMPORTANT!



The M-VB  
**PYREX GLASS FLOAT**  
that licks your Humidifier  
Valve problems

### THIS FLOAT REALLY FLOATS



This special glass pyrex float is temperature-breakage free and can be half submerged in cold water while boiling water is poured on the exposed portion. It also has remarkable toughness and will stand any reasonable handling.



It is unaffected by boiling, saturated solutions and is impervious to corrosion, thereby giving long, satisfactory service *anywhere* regardless of the mineral content of water.

With this new float M-VB inexpensive Humidifier Valves become more than ever the Valves that are tops at any price—the kind that can be installed in 30 minutes and do their jobs without call-backs or kick-backs. Get in touch with the manufacturer of your warm air furnaces or M-VB today.



# M-VB

**MORENCY-VAN BUREN DIVISION**  
**SCOVILL MANUFACTURING CO.**  
Sturgis, Michigan

**SCOVILL SAVES YOU TIME IN SELLING—TIME IN INSTALLING**

Complete lines of humidifier valves maintained at  
Waterville, Connecticut—San Francisco and Los Angeles, California





## Prices Again Reduced

Hereafter Cheney Flashing and allied products will be merchandised directly by The Cheney Company to Sheet Metal and Roofing Contractors through recognized distributors of sheet metals.

Cheney Flashing (three-way) is now available in three weights of copper: 16 ounce, 10 ounce, 6 ounce, and priced as low as 16c per square foot.\*

## Quaker Flashing



TWO-WAY, 16 OUNCE

Cheney introduces a brand-new two-way flashing that prevents lateral movement. Quaker Flashing has a plain selvage for the counterflashing face of 4" or any dimension, and has a 1/4" turn-up at the back edge. Flashing is made in widths up to 36" and is shipped in flat sheets with the 1/4" turn-up all made so that no shop work is necessary. This means you can ship the flashing direct to the job without opening the cases and bending to shape in the shop. Quaker Flashing is low in price.

Ask your distributor for our new price lists.

\* 6-ounce copper.

**THE CHENEY COMPANY**  
ARCHITECTS BUILDING, PHILADELPHIA, PA.

NEW YORK—101 Park Avenue • CHICAGO—6 North Michigan Avenue  
NEW BEDFORD, Mass.

## New Literature

For your convenience in obtaining copies of new Literature use the coupon on this page.

### 186—Kooler-Aire and Blower-Filter Units

United States Air Conditioning Corporation, Northwestern Terminal, Minneapolis, is distributing Bulletin 440BF covering U S AircO blower-filter package unit; Bulletin 500 covering U S AircO suspended coil units for cold water and direct expansion, and a descriptive circular on the Midget Kooler-Aire evaporative cooler.

### 187—Aristocrat Propeller Fan Blades

The Torrington Manufacturing Company, Torrington, Conn., is distributing a new catalog covering Aristocrat propeller fan blades with instructions and considerations for selecting fan blades, explanation of test codes and simple fan laws, with specifications followed by performance ratings for free air delivery as well as pressure.

### 188—Window Fan

Viking Air Conditioning Corporation, 9500 Richmond Ave., Cleveland, is distributing a 4-page folder entitled "Gone with the Wind!" illustrating and describing the Viking window fan for hotel rooms, private homes, stores and offices. Models are available for both lower and upper sash installation.

### 189—The P&H Weld

Harnischfeger Corporation, 4400 W. National Ave., Milwaukee, manufacturers of welders, electrodes, cranes, hoists and power excavators, has released the first issue of "The P&H Weld," the purpose of which is "to act as a central bureau for receiving and disseminating information on current welding practices."

The first issue contains a discussion of electrodes and their applications. In all discussions of welding processes, photographs and diagrams show jobs on which the processes were applied.

### 190—Janitrol Advertising Portfolio

Surface Combustion Corporation, 2375 Dorr St., Toledo, Ohio, is distributing a new Janitrol Advertising Portfolio, designed for utilities and dealers' use. The Portfolio contains samples of current direct mail and salesmen's leave pieces with suggestions for their use.

Included are four special bulletins covering special activities such as the employee contests, oil burner and stoker replacement campaigns.

Samples are available, also an estimate of cost, probable results, time required for campaign, etc.

#### FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave., Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Circle numbers in which you are interested):

83	84	85	86	87	88	89
90	91	92	93	94	95	96
97	98	99	100	101	102	103
104	105	106	107	108	109	110
111	112	113	114	115	116	117
118	119	120	121	122	123	124
125	126	127	128	129	130	
165	166	167	168	169	170	171
172	173	174	175	176	177	178
179	180	181	182	183	184	185
186	187	188	189	190		

Name ..... Title.....

Company .....

Address .....

Are you Manufacturer.....Jobber.....Dealer.....

## Now in 3, 5, 7½, 10 and 15 Ton Capacities **CURTIS Packaged Air Conditioners**

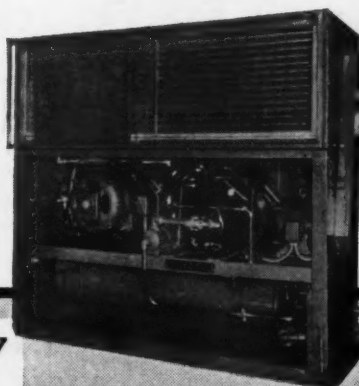
● With a wide range of from 3 to 15 tons capacity, Curtis Packaged Air Conditioners now meet the demands of a variety of markets with complete mechanically refrigerated air conditioning at low cost.

Every type of retail establishment is now a prospect for this Curtis equipment, for they can profit from the advantages of air conditioning without costly installation charges or disturbance to fixtures.

The Curtis Store and Office Cooler and the Curtis Remote or Central Type Air Conditioner are completely factory designed and built packaged units that cool, dehumidify, circulate and filter the air. They are quickly and easily installed, readily financed, and are adaptable for heating if desired.

The demand for Curtis Packaged Air Conditioning is growing every day. Write to Curtis for complete information on the Curtis line.

*Meet ALL  
Requirements*



7½, 10, 15-ton Remote or Central Type Air Conditioner



3 and 5-ton Packaged Type Air Conditioner

**Curtis Refrigerating Machine Company**



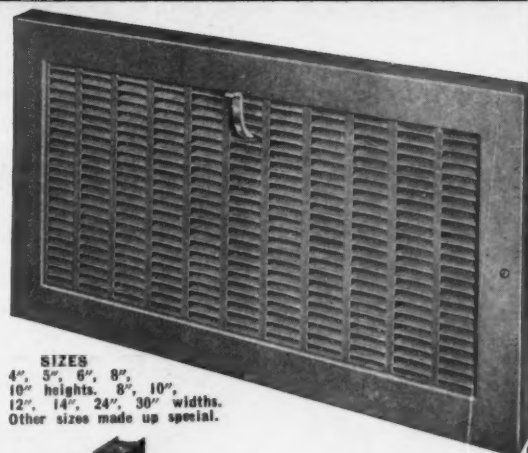
Division of  
Curtis Manufacturing Co.  
1946 Kienlen Ave. St. Louis, Mo.  
Established 1854

## **CHAR-GALE "Seal-Tite" REGISTER**

**"Seal-Tite" means  
No More Wall Streaking**

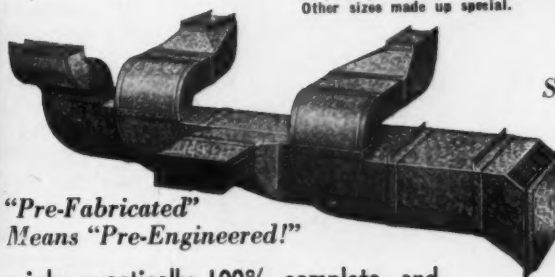
The CHAR-GALE "Seal-Tite" REGISTER completely eliminates wall streaking. It pleases your customers, saves your time and cuts installation costs. Our exclusive flexible packing member is an integral part of the back frame. Handsome in appearance—maximum capacity—air flow directed for comfort without drafts. Baseboard and sidewall types.

**YOUR JOBBER CAN SUPPLY YOU AT A NEW LOW PRICE**



**SIZES**  
4", 5", 6", 8", 10",  
12", 14", 24", 30" widths.  
Other sizes made up special.

**CHAR-GALE**  
*"Pre-Fabricated"*  
**DUCTS AND FITTINGS**



*"Pre-Fabricated"*  
Means "Pre-Engineered!"

Our ducts and fittings will handle your jobs practically 100% complete, and automatically take care of the engineering for you. All sizes accurate—no delays when installing. Try Char-Gale Ducts on your next job. Your jobber can supply you.

Send for new No. 40  
Catalog

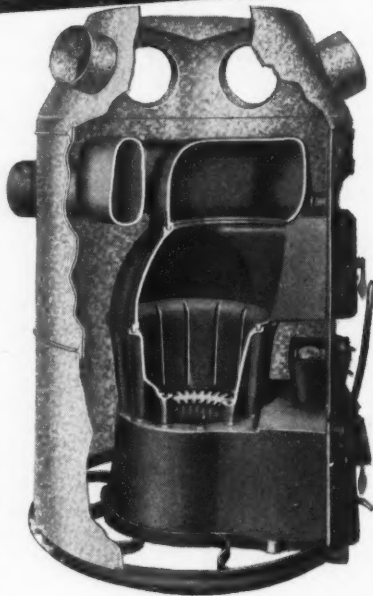
Showing complete line  
of Char-Gale "Seal-  
Tite" Registers, "Pre-  
Fabricated" Ducts and  
Fittings, and the new  
Char-Gale Replacement  
Casings to modernize  
old heating plants.

**CHAR-GALE MANUFACTURING CO., 3125 Hiawatha Ave., Minneapolis, Minn.**

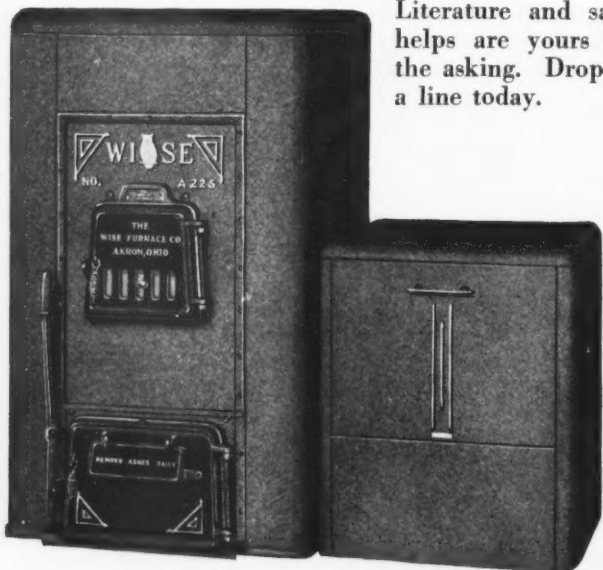


**BETTER JOBS • BIGGER PROFITS**  
with the  
**WISE SERIES "A"**  
for GRAVITY or AIR CONDITIONING

**T**HAT'S no "false alarm" either. Better jobs and bigger profits can easily be yours if you specify and install the WISE Series "A" for gravity or air conditioning installations. For gravity work the Series "A" offers several advanced features to assure top performance. Items such as the one-piece cellular firepot, the new ashpit and lower front and the one-piece, self-cleaning radiator give your customer clean and efficient heating consistent with the utmost economy.



For Winter air conditioning jobs the Series "A" is furnished with a one-piece square base and enameled square casing as shown. These two models will enable you to cope with the competition, and intelligent and aggressive salesmanship will clinch the jobs for you.



Literature and sales helps are yours for the asking. Drop us a line today.

**WISE FURNACE CO.**  
AKRON OHIO

## Association Activities

### Wisconsin

The Sheet Metal Contractors Association, of Wisconsin met at the Builders Club in Racine, with the Racine local as hosts, on May 11. The meeting was called to order by President T. P. Brenner in the presence of 24 members.

Chairman Heilscher of the Membership Committee reported one new member.

Member Feitting filed the report for Chairman Schaar of the Warm Air Heating Committee. He distributed a sample sheet of the work being done by the Milwaukee Furnace Committee in their endeavors to publish a Hand-Pocket book which would contain data similar to the distributed sample of one operation. Similar operations and installations on air conditioning, forced air heating, etc., are to be included, so that the book would fortify one to estimate a job with ease and comfort. The book distributed among members would educate them as to the correct methods of figuring and thus create a better condition in the industry. He stated that the Milwaukee local would be pleased to co-operate with the State association so that the members of the state would receive the benefits, the price of the book is to be from \$3 to \$5.

The secretary read letters issued to the various local and state associations regarding their activity on advertising. Quite a discussion ensued. It was brought out that it may be better to attempt to purchase certain memberships in the Wisconsin Manufacturers' Association, so that the entire State membership could be circularized with their bulletins. Chairman Goodwin reported his committee's activities and submitted the proposition of the Industrial Training Institute method of training mechanics.

Director Van Lannen of the National Association explained what had been accomplished by the newly formed National association. He and Director Gehrke attended the Toledo Conference.

R. G. Suettinger and M. M. Petersen paid their yearly dues and received their 1940 Certificate of Membership.

W. H. Born of Fond du Lac applied for membership, was accepted and his name ordered on the roster.

C. W. Pansch addressed the meeting on oil burning with its technical and practical phases, followed by discussion.

Green Bay was selected for the next District meeting on June 8th. The Racine local supplied a superb fish lunch.

Paul L. Biersach, Secy.

### Fox Valley

The Fox Valley Furnace and Sheet Metal Contractors Association held their regular monthly meeting at Elgin, Illinois, on May 20 at the YMCA building, with cafeteria style dinner at 6:30, followed by the meeting—Jack Stowell, president, presiding. There was a good turnout.

Don Anderson of Dundee and Charles G. King of Geneva, Illinois, were guests.

Burrell Conover and Phil Ries of Aurora, William Klinkey of St. Charles and Fred Lamp of Elgin were appointed as a committee to complete arrangements for the association's annual field day to be held in July.

A. R. Harris of Hammond, Indiana, gave a splendid talk on shop practice and a demonstration of his utility bending brake.

The next meeting will be at Aurora on June 17th.

Alvin Lohbauer, Secretary.

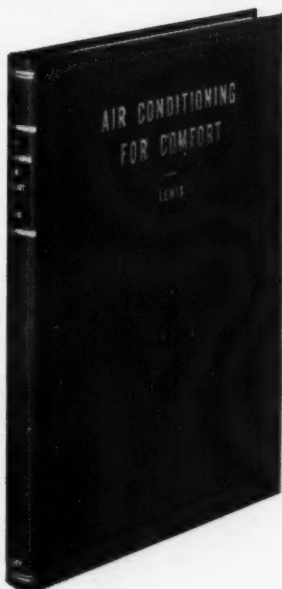
### Chicago

The Furnace, Air Conditioning Sheet Metal Institute met at Rhineland Hall, 3159 Southport Avenue, Chicago, on May 23. District Administrator Bell spoke on the Wages and Hours act, at the request of various members who were uncertain of the interpretation of the act.

Bill Ufer of Mercoid outlined 1940 educational work.

Jack Weiner donated a steel cabinet as a valuable attendance award. Refreshments were served.

# KNOW AIR CONDITIONING



Send Today  
for  
Samuel R. Lewis'

## "AIR CONDITIONING FOR COMFORT"

Third Edition  
288 Pages—Illustrated  
\$2.50

Here is a book that presents—in simple, readily understandable form—every kind of information necessary for an accurate and thorough knowledge of air conditioning principles, equipment, and practices. Written by S. R. Lewis, a widely-known consulting engineer who has been active in air conditioning work for more than thirty years, it deals with all angles of the air conditioning subject from the practicing engineer's viewpoint. The designing procedures explained in the book are, for example, in every detail the same procedures employed today by the author's own organization.

Featuring this third edition are several entirely new chapters on phases of the subject not previously treated, including noise control, air conditioning measurements, air conditioning standards, fire protection codes and operating suggestions. Brand new designing examples are also used, together with new forms for recording the design data, the proper filling-in of which is explained step-by-step.

### OF VALUE BOTH AS A REFERENCE AND TEXT

Engineers in air conditioning will find the new "Air Conditioning for Comfort" invaluable as a reference book, while salesmen, students, and others may rely on it to give them a clear knowledge of fundamentals, and of the latest air conditioning methods and equipment.

Send for a copy today. We know you will consider this volume the most readable and complete book on the air conditioning science you have yet seen. You will risk nothing in ordering a copy, for you will be privileged to return it for a refund if for any reason it should prove unsatisfactory. Order your copy now.

**KEENEY PUBLISHING COMPANY**  
6 N. Michigan Ave. Chicago, Ill.



Fabricating coal chutes for gas producer from 10-gauge iron.

After 4 years, this Lincoln user says,  
"We've averaged only 5c  
per month for welder upkeep"

"We've used our Lincoln Welder continuously since we bought it more than four years ago. Up until recently, we hadn't spent a cent for upkeep. Then we replaced the set of brushes at a cost of \$2.40. That's 5c per month—almost nothing.

"Most important though is the improvement in the quality of our work and the resultant new business that has come from arc welding. Our Lincoln Welder has paid for itself many times over out of increased income and profit."

So says Mr. Thos. Gillespie, Mgr., Koerbel Bros., Jeannette, Penna.

And so say scores of sheet metal shop users of the "Shield-Arc Jr."—the d.c. arc welder of broad range and low price—the welder that requires practically no maintenance. Start cashing in on arc welding with this new Lincoln.

**NEW LOW PRICE \$140** for the 75-amp. "Shield-Arc Jr.," stationary model. (Portable model as illustrated \$8 additional.) Equipped with "Job Selector" and Current Control to enable you to weld more jobs and to weld easier and faster.

Consult the nearest Lincoln office or mail the coupon today for details.

## THE LINCOLN ELECTRIC CO.

Largest Manufacturers of Arc Welding  
Equipment in the World



**THE LINCOLN ELECTRIC CO.**  
Dept. EE-23, Cleveland, Ohio

Send complete details on New 75-amp.  
"Shield-Arc Jr." Welder.

Name \_\_\_\_\_ Position \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



## With the Manufacturers . . .

### Niemoeller Represents Janette

Janette Manufacturing Company, 556 W. Monroe St., Chicago, announces the appointment of A. R. Niemoeller, 5817 Itaska St., St. Louis, as sales and service representative.

### Scott Assistant to Mueller

James R. Scott has been appointed Assistant to the President according to an announcement by H. P. Mueller, president of the L. J. Mueller Furnace Co., Milwaukee.

### Livingston Is Agricola Superintendent

I. C. "Doc" Livingston has been appointed plant superintendent of Agricola Furnace Co., Inc., of Gadsden, Alabama, according to an announcement by C. Ackerson, Vice President.

"Doc" joined the organization January 1, 1933, after years of service with Marshall Furnace as well as Monitor Furnace.

### Maid-O'-Mist Representatives

Maid-O'-Mist, Inc., 215 N. Aberdeen St., Chicago, has recently appointed the following representatives:

E. F. Tierney, 19 State Street, Westfield, Massachusetts—to cover the New England States exclusive of Connecticut.

G. Cliff Carroll, Builders Exchange, Cleveland—to cover the northeastern section of the State of Ohio.

W. D. Carter, 6120 Eastwood Terrace, Norfolk, Virginia—to cover the States of Virginia and North Carolina.

Fred E. Triggs, Box 1, Highland Park, Des Moines, Iowa—to cover central Iowa.

Heating Assurance, Inc., 124 E. Augusta Avenue, Spokane, Washington—to cover the western part of the State of Washington and the northern part of Idaho.

### York-Heat Expands

In line with its 1940 expansion program, York Oil Burner Co., Inc., York, Pa., has recently added a large warehouse to its factory facilities, according to an announcement by the president, A. J. Seiler.

### Ryerson Enlarges Detroit Plant

Joseph T. Ryerson & Son, Inc., Chicago, announces a new high-bay type span has been added to the Detroit plant.

The new span increases floor space by over 30,000 sq. ft., bringing the total floor area of the Detroit Ryerson



plant to approximately 250,000 sq. ft. In addition to housing part of the hot rolled steel stock, the new building will greatly increase facilities for Ryerson's complete reinforcing steel-service to contractors and builders.

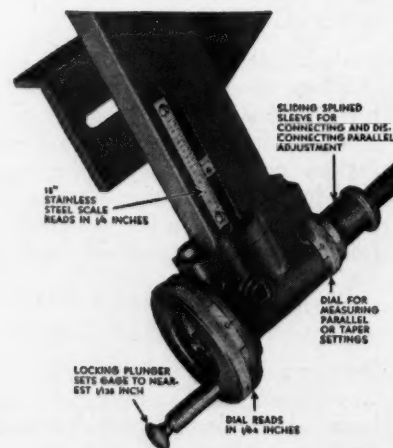
Joseph T. Ryerson & Son, Inc., operate a total of ten large and complete steel-service plants in the principal industrial centers of the country.

## NEW BALL BEARING, SELF-MEASURING PARALLEL BACK GAGE



Easy foot operation  
Strong, rigid bed  
Self-locking holddown  
Triangular Section  
Crosshead  
Capacity, 18 gage

Write for Bulletin 80-C



### Now Standard Equipment on Niagara 196" and 1120" Foot Operated Shears

This new Niagara ball bearing, parallel back gage is extremely quick, accurate and easy to adjust. It is self-measuring to increments of 1/128 inch.

Gage can be rapidly adjusted for taper cutting by disengaging the internally splined sleeve on connecting shaft.

The gage bar is exceptionally rugged. A truss rod stiffens the gage bar and provides an adjustment for maintaining straightness after long, hard usage.

### NIAGARA MACHINE & TOOL WORKS

637-697 Northland Ave.

Branches:

Cleveland

Detroit

Buffalo, N. Y.

New York

Pin Your Faith on  
the PREMIER Line ...  
It'll Never Let You Down



Let PREMIER Help You Achieve  
Lasting Success in Your Around Air Conditioning

BLOWERS!



Centrifugal type blower used in some PREMIER units. One piece cast iron base and cast iron bearing support. Randall bearings. Statically and dynamically balanced blower wheel on 1 inch polished steel shaft. Variable speed drive.

Once in a blue moon comes the kind of opportunity that PREMIER offers you today. Find out now about this opportunity. Get the new PREMIER Portfolio that tells the story of enhanced profits and a safeguarded future.

Get acquainted with the amazingly complete PREMIER line—a line that covers the entire field of domestic heating, automatic fuel burning, air conditioning, and summer cooling. Learn how PREMIER helps you—in advertising, selling, engineering, and financing. Find out about the exclusive PREMIER franchise!

Act NOW for the sake of your future. Write us today for the whole profit story of PREMIER!



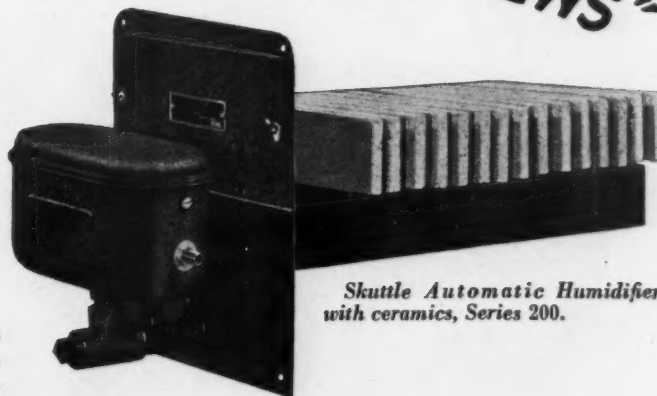
PREMIER offers you today's most complete line of blowers, including not only package units with cabinets and filters, but also a full line of blower assemblies only, for any requirement.

Blowers and assemblies are available with capacities from 1,000 CFM to 20,000 CFM. Blowers are of positive, centrifugal type, delivering large volumes of air at low operating speeds. Capacity ratings are certified—and prices are amazingly low, quality considered.

**PREMIER FURNACE COMPANY, Dowagiac, Mich.**  
Manufacturers of Warm Air Heating and Air Conditioning Equipment



"YOU CAN PROFIT BY THIS NEWS"



Skuttle Automatic Humidifier with ceramics, Series 200.

● Good news travels fast—particularly the kind that means more humidifier sales and profits to you. With this new style Skuttle Automatic Humidifier you can now sell a humidifier that is expressly designed for forced air furnaces. Because this Skuttle unit has an evaporating pan that is only 20" long, 2" deep and 3" wide, the ceramics extend beyond the pan on each side thus giving sufficient evaporating surface and proper humidification. This unit can be easily placed in the plenum chamber of the furnace and has a removable door on the collar for easy access to ceramics.

Standard equipment includes the famous Skuttle Control Valve

and float that insures trouble free operation at all times. Attractively finished in black wrinkle and vitreous enamel, this Series 200 Skuttle Automatic Humidifier makes it the furnace accessory item to handle for increased profits. Why not order a sample unit today—their prices and discounts will interest you.

MANUFACTURERS: Special sizes can be made to your specifications.

WRITE TODAY FOR

**Skuttle**

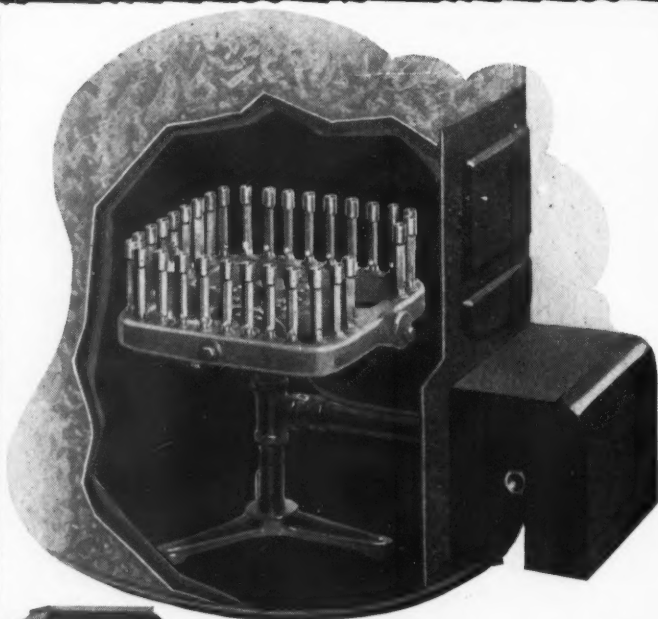
INFORMATION

J. L. SKUTTLE COMPANY

AUTOMATIC HUMIDIFIERS

999 FRANKLIN ST., DETROIT, MICH.





## DALZEN *Multi-Tip*

### CONVERSION GAS BURNER

#### offers You 1940 Profits!

- Quickly and easily installed in any type of heating plant—steam, hot water, hot air or vapor.
- Scientifically designed to produce more heat from a given amount of gas for greater economy throughout the heating season.
- Tested by thousands of installations in every type of home. Simplified design offers trouble-free operation.
- Unit includes latest type thermostatic and safety controls.
- Priced to sell in TODAY'S market—at profitable discounts to dealers.

Dealerships are now available in certain localities. Write us today for attractive terms and prices.

**Dalzen Manufacturing Co.**  
511 Leib Street, Detroit, Mich.



## DALZEN *Tropic Breeze*

### WINTER AIR CONDITIONER

This factory-assembled HI-BOY unit is a complete packaged product. Designed for either gas or oil firing, the burner assemblies are interchangeable, permitting

purchaser to change from gas to oil or from oil to gas at very little expense. Available with Multi-Tip Gas Burner or choice of two different type oil burners. Write for details.

## Want QUIET VENTILATION?



## Then READ This!

It takes more than men, materials, and machinery to produce a quiet fan. It takes, most of all, experience. Buffalo engineers have been developing the "Limit-Load" fan not for five years, or ten, but for fifty years! All the designs of the past, discarded, contributed to this final one.

And with the addition of the Buffalo Silent Floating Base—here's the QUIETEST fan you can buy, by any test. Write for bulletins.

### BUFFALO FORGE COMPANY

497 Broadway Buffalo, N. Y.

Branch Engineering Offices in Principal Cities  
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

*"Buffalo"*

**Limit-Load**  
REG. U.S. PAT. OFF.

## Conoidal Fans

## With the Manufacturers . . .

### General Controls in Boston

General Controls Co., 700 N. Joy St., Glendale, Cal., manufacturers of pressure, temperature and flow controls, announces the opening of a branch office at 687 Boylston St., Boston. C. W. Marsh, sales engineer, will be in charge.

### Cheney—New York and Chicago

The Cheney Company, manufacturers of Cheney Flashing and allied products, announces the change of their Chicago address to 6 North Michigan Avenue and their New York office to 101 Park Avenue. The Chicago office is in charge of Paul G. Davis and the New York office is in charge of H. R. E. Austin.

To meet the increasing demand for complete waterproofing protection of all types of masonry construction by the use of permanent sheet metal flashing, the Cheney Company now produces Cheney flashing in various weights of metal. Cheney also introduces Quaker Flashing (two-way) with a plain selvage for the counterflashing face and a 1/4-inch turn-up at the back edge.



Paul G. Davis

### Industrial Progress Award Program

The James F. Lincoln Arc Welding Foundation, Cleveland, is distributing a booklet entitled "We Who Work at Our Industrial Jobs," including a plan for participating in the \$200,000 Industrial Progress Award Program, covering advances and improvements made between now and June 1, 1940.

### Heating and Equipment School

The Majestic Company, Huntington, Indiana, held a heating and equipment school at their plant early in April and the plant was thrown open to visitors to inspect



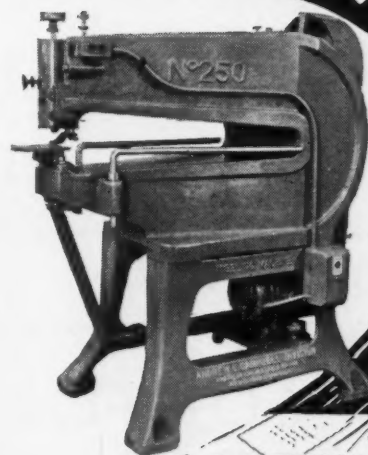
products, equipment and methods. The principal speaker was Lorin G. Miller, Head of Mechanical Engineering Department, Michigan State College, East Lansing, Michigan, on the subject of "Codes—Their Importance and Applications."

### Metal Stamping Changes Name

The name of The Metal Stamping & Mfg. Co., 16816 Waterloo Road, Cleveland, has been changed to Morrison Products, Inc.

There has been no change in stockholders, directors or personnel. In addition to stampings and assemblies to specification, the company manufactures and sells Air-stream blowers for the air conditioning industry, drawn steel guards for portable tools and bench grinders, drawn steel pulleys for V-belt drives and automobile replacement parts. Hunter Morrison is vice president and general manager.

*WHY orders are pouring in for the*



## NEW NO. 250 CAMPBELL NIBBLER

**Cuts Wider Stock**—The exceptionally deep throat of this new machine is designed to cut 1/4-inch mild steel and 3/16-inch stainless steel up to 70 inches wide.

**Adjustable Stroke**—Less than a minute to adjust the stroke for any thickness of stock—from extremely thin up to 1/4-inch. This valuable feature also makes possible the use of thin templates on any thickness of stock up to machine capacity.

**Three Speeds**—You can run at 350, 500 or 800 RPM. by simply shifting a V-belt.

**Cuts in all Directions**—The operator retains a two-hand grip on the piece while cutting it in any direction.

**BUY ACCO QUALITY** in Campbell Cutting Machines; Wright Hoists and Trolleys; Page Welding Electrodes; American Chains; Tru-Lay Preformed Wire Rope; Reading-Pratt & Cady Valves; Page Wire Fence.

### ANDREW C. CAMPBELL DIVISION

Designers and Builders of Special Machinery  
Bridgeport • Connecticut



*In Business for Your Safety*

**AMERICAN CHAIN & CABLE  
COMPANY, Inc.**



## Here's your ticket to EXTRA PROFITS

### AIR CONTROLS, INC.

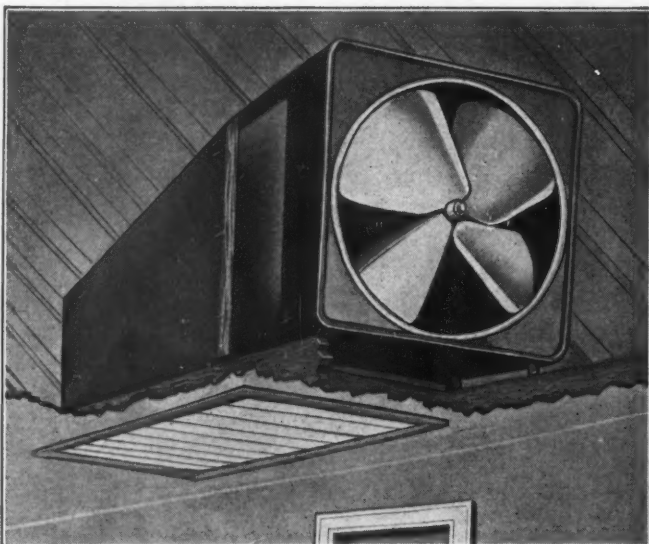
Div. of The Cleveland Heater Co.  
1933 West 114th St., Cleveland, Ohio

FIRM .....  
INDIVIDUAL .....  
ADDRESS .....

### MAIL IT TODAY

for complete information about

# REX AIRATE COMFORT COOLING



### The "Attik-Pak" (Attic Package) is a non-competitive unit because:—

- .....it is an all-steel unit with automatic ceiling shutters offering superior advantages to the user.
- .....its ratings which are backed by A.S.H.V.E. tests show *net* air delivery, after allowance for the losses due to the resistance of ceiling shutters, vent-box and attic outlet louvers;
- .....it requires so little time to install, that the seller is free most of the time to do constructive selling;
- .....its greater value is apparent to every prospect. You do not need to cut your profits in order to sell against ordinary fans.

There's a REX-AIRATE model for every home  
and commercial need priced from \$49.50.



Div. of  
The Cleveland Heater Co.  
Makers of REX quality appliances for 35 years

## With the Manufacturers . . .

### Third Annual Anthracite Conference

Anthracite Industries, Inc., Chrysler Building, New York City, held their third annual conference on May 9 and 10 at Packard Laboratory, Lehigh University. 17 papers comprised the two-day program.

### Boyne to Manage Stainless Sales

Russell M. Allen, general sales manager, Allegheny Ludlum Steel Corporation, announces the appointment of C. B. Boyne, manager of stainless sales, with headquarters in the general office of the corporation, at Pittsburgh, Pennsylvania.

### Stanley H. Brown President Electrol

Electrol Incorporated, 934 Main Ave., Clifton, N. J., announces that at a recent meeting of the Board of Directors, Stanley H. Brown was unanimously elected president to succeed Morgan J. Hammers. Mr. Brown started in the oil burner business in 1924 and joined Electrol in January, 1938.

Stanley H. Brown  
President  
Electrol, Inc., Clifton, N. J.



### Perry Chief Engineer Oil Devices

Oil Devices, engaged in development work on burners invented by Jim Breese, who directs organization, announces the appointment of Stanley Perry as chief engineer. Mr. Perry will introduce new developments to the industry and assist manufacturers in adapting these new inventions to their products. The company conducts a consulting engineering service.

### Ryerson Host to 3,000 Visitors

Joseph T. Ryerson & Son, Inc., 16th & Rockwell, Chicago, held open house on May 11 to acquaint customers with stocks and plant facilities, and were hosts to more than 3,000 visitors.

These guests witnessed the opening of the new steel



building and went on specially conducted tours through the plant, where new services and products were on display. 150 guides stationed throughout the warehouse and offices explained the technical exhibits and processes.

The route of a typical steel order was traced from the order department to the loading floor. Ryerson maintains private telegraph and teletype terminals, and mail is collected hourly from the post office. The city desk has a capacity for handling more than 1,000 telephone orders.

## QUALITY EQUIPMENT-- FROM HESS-- COSTS LESS



### INCREASED SALES and PROFITS

Are assured if you sell Hess equipment. Why sell ordinary furnaces as sold by mail order concerns and other competitors when Hess offers superior value and performance at low prices.

### THE HESS LINE IS COMPLETE

It's Different and Better.

The Hess furnace is rectangular throughout with heavy welded steel innerbody. Hess blower-filter units, oil burners, stokers and accessories, fill every dealer requirement. Exclusive territory protection. Free plan service. FHA terms. Free consumer literature gives every advantage to a Hess dealer.

**WRITE FOR DEALER PORTFOLIO**  
**HESS WARMING & VENTILATING CO.**  
1211-27 S. WESTERN AVE. Founded 1873  
CHICAGO, ILLINOIS

THE  
PATENTED

# FIELD

BAROMETRIC

*Draft Control*

### HELPS THERMOSTATS OPERATE EFFICIENTLY

The FIELD Draft Control . . . operative in as little as .005 of an inch of atmospheric pressure . . . is the most efficient aid to delicately regulated thermostatic controls ever made. Sound engineering principals executed in sturdy materials guarantee the long life and perfect operation of the Field control. Write us today for information on the new six inch series and special installations.



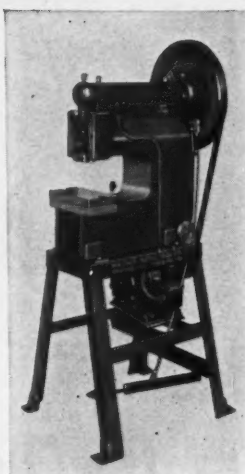
**CONCO ENGINEERING WORKS**  
DIVISION OF  
**H. D. CONKEY & COMPANY • MENDOTA, ILLINOIS**

AMERICAN ARTISAN, JUNE, 1940

BENDING  
BRAKES

## WHITNEY-JENSEN

METAL  
TOOLS



## NEW!

**NO. 129**

**HEAVY-DUTY  
MOTOR-DRIVEN  
PUNCH**

Check these features for VALUE! Capacity, 5 tons. Length of stroke, 1 1/4". Stroke adjustment, 1 3/4". Die space, stroke down, adjustment up, 4". Depth of throat, 12". Complete with motor. Guaranteed. Standardized construction. Punch and die service available.

### Powerful • Accurate • Durable

Box-section frame of welded steel plates. Welded angle iron base. Accurately machined. Adjustable wear gibs. Bronze bearings on all rotating parts. Please write for new circular and complete information.

WHITNEY METAL TOOL CO. • 91 Forbes Street, Rockford, Illinois

### EASIER AND MORE PROFITABLE TO SELL BECAUSE IT GIVES USERS



*Measured Moisture*



Measured Moisture! Here's a talking point that gives you a big advantage over the dealer who offers furnace users just a mechanical pan filler. It's a *plus* feature of the THERMO-DRIP Humidifier . . . the direct effect of regulating the water feed by temperature. No more nor less evaporation occurs than the amount of water fed to the pan at any specific temperature. Investigate. Write for complete details.

**AUTOMATIC HUMIDIFIER CO.**

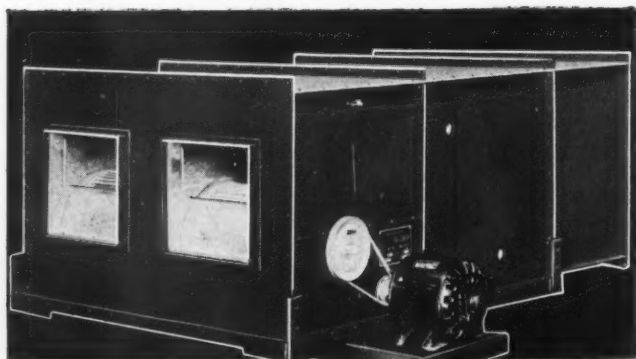
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## THERMO-DRIP

*Automatic* HUMIDIFIER





## CLARAGE Multitherm Units

Designed to control temperature and humidity within close limits. Can be made completely automatic in operation, regulated by room thermostat and humidistat.

✓ Cooling  
✓ Heating  
✓ Complete Conditioning

Finest type of equipment available for small summer cooling, winter heating or complete year-round air-conditioning jobs. Widely used in factories, offices, stores, etc. Highly efficient; remarkably compact; easily installed in any idle space.

Write for Bulletin 107 describing various arrangements and giving capacity ratings.



CLARAGE FAN COMPANY  
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THE NEW MULTI-THERMEX HEAT EXCHANGER

THE NEW PATENTED "AMPLIFIRE" BURNER

COMPACT—TAKES NO MORE ROOM THAN THE SHOVEL, CAN AND BROOM

POPULAR MODELS COME FACTORY ASSEMBLED!

YOU'LL MAKE MORE PROFITS WITH JANITROL

With many new sales producing features, this 1940 popular priced Janitrol strikes a new high in gas-fired winter air conditioning... money-making features that are easy to sell. Also, having the popular size models come completely assembled relieves you of much of the work and worry of installation and testing. Remember, too, that Janitrol is a product of the world's oldest and largest manufacturer of gas-fired equipment... an assurance to you of not only a good product but fair and generous treatment in factory-dealer relationship, both factors making for greatly increased profits. Write for "Dealer Information," Surface Combustion Corporation, Toledo, Ohio.

WINTER AIR CONDITIONERS  
CONVERSION BURNERS  
UNIT HEATERS

# JANITROL

## Anchorage In Copper Roof Application

(Continued from page 65)

construction (Fig. 4-A) the cleat is secured to the surface of the roof and locked into the standing seam as the seam is formed. Cleats are also locked into the cross seam at the end of each sheet. In batten construction (Fig. 4-B) cleats are fastened to each side of the batten and locked into the seam with the cover as it is formed. Some roofers prefer to use a longer cleat and have it extend under the batten in one continuous unit instead of a cleat on each side. In this case, the cleat may not be actually nailed to the batten but can be secured by the fastening of the batten itself. Cleats in cross seams (Fig. 4-E) are the same as in standing seam construction.

In flat seam, of course, small sheets 14 by 20 inches should be used with two cleats along the longer side and one on the shorter. Sometimes, where there are large areas of flat seam construction and expansion battens are used, the sheets are laid with the longer dimension at right angles to the batten and cleats on the short side parallel to the batten are omitted.

Where there are changes in slope, we often have a case where the lock between the two areas needs to be held tighter to prevent wind liftage. Indi-

## WHEN THE CONTROL GOES WRONG...YOU LOSE

Temperature controls that can't take it consistently and over a long period of time are costly things for you who install heating or air conditioning units—and service them.

They mean losses where you should have profits—unnecessary service calls; losses in customer goodwill; and sometimes, loss of the customer himself... and his friends.

Those things don't happen when the controls you install are actuated by Chace High Temperature Thermostatic Bimetals. Chace has been making dependable bimetals for many years—often to meet most adverse conditions. Many of the foremost controls employ Chace Bimetals as their activating element. Those controls cannot leak... and will not weaken. They afford your customer, at all times, accurate and unfailing operation. And they save you much unnecessary "grief."

*Specify Chace*

Control manufacturers are invited to consult us for type of Chace Thermostatic Bimetal best suited to meet specific demands.

**W.M. CHACE CO.**  
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DETROIT, MICHIGAN

vidual cleats will not do this job so well as will a "continuous" cleat. In this construction, strips 4 feet long and as wide as the usual cleat is long, are used in lieu of cleats. They are locked into the seams, as are the cleats, and should be nailed on 4-inch centers. The edge of the strip is turned over the nails.

Cleats are, of course, not practical at an eave. Here the principle of holding the copper securely by anchorage is accomplished by locking the sheets over an edge strip, several varieties of which are shown in the accompanying Fig. 5. A very common mistake, unfortunately, is to nail copper directly at such points and not use the edge strip. Nailing holds the copper too tightly and prevents movement to take care of expansion and contraction.

Where the finish of the copper roofing is in a reglet, we must again apply our principle of anchorage rather than holding the copper in such a way that it is not free to move. For narrow flashing, the copper may be anchored directly into the reglet, but where the sheet is over 12 inches wide, it is preferable to secure the copper by locking it onto a separate strip in the reglet similar to the "continuous" cleat mentioned above. The lead caulking in the reglet need not be continuous nor need it come to the top of the reglet which may be filled with an elastic cement. Various details of reglet construction are shown in the lower half of Fig. 5.

## AJAX

A NEW LINE OF  
**PREFABRICATED DUCTS and FITTINGS**  
for Forced Air and Air Conditioning Installations



Our Catalog "A" (Gravity Fittings), Catalog "B" (Forced Air Fittings) are yours on request.

**THE CINCINNATI  
SHEET METAL & ROOFING CO.**

Furnace Fitting Department

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Sell the Furnaces that have  
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**NIAGARA**

**Winter Air Conditioning  
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**G**AS FURNACES...Copper chrome cast iron;  
or...Toncan iron heat exchangers...selection of belt or direct drive blowers with two-speed control...summer-winter switch...modern casing design...concealed controls...high efficiency...low prices...A.G.A. approved.

Also coal and oil-fired furnaces.

**THE FOREST CITY FOUNDRIES CO.**

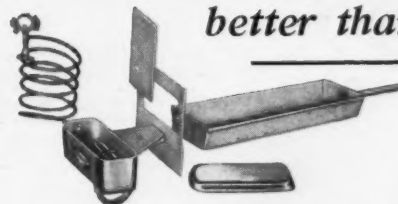
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ATTRACTIVE TERRITORIES ARE OPEN FOR  
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**BADGER HUMIDIFIER**  
better than ever...!



**T**HE new Badger Humidifier is exactly the unit to help you get extra profit on new or old heating installations. Extra profits aren't

hard to take any time and you'll get them easier and faster by showing these advanced features of the Badger to your customers.

Stainless Steel evaporating pan to prevent formation of rust or scale.

Equipped with adjustable float and automatic valve in chamber outside of hood and away from heat to prevent liming.

Made from best obtainable material and in sizes to fit all furnaces.

Write today for further information and literature.

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## Parapet Metal Casing

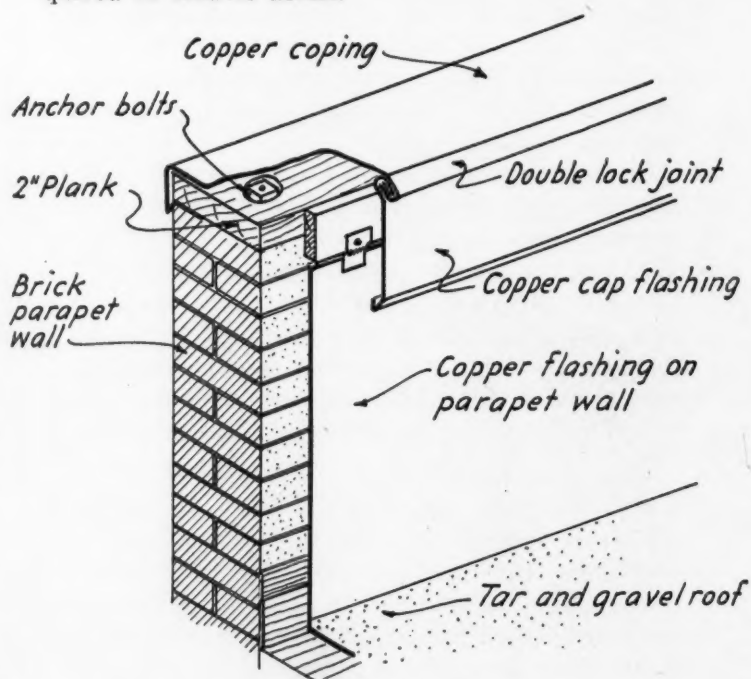
(Continued from page 70)

selvage. On street sides of the structure, about 400 ft. long, white marble wall topping was installed. This was flashed to brick work with the lead coated throughwall type of material mentioned. Bright metal was used for inner-wall applications.

The extra width of the throughwall flashing permitted the contractor to lock longitudinal edges into cap flashing strips with 4-in. exposure depth. Wall covering then was slipped up beneath the cap flashing and, being unattached, allows free riding and prevents possible fracture due to expansion. The lower edges of the parapet flashing then were covered with the tar and gravel that comprises the roof covering.

Inner walls, entirely of brick, received 2-in.-thick wooden planking bolted down, then flashing caps of copper were applied throughout their entire length of about 400 ft. Transverse edges of cap pieces were interlocked with adjacent pieces and cleated. But the 1½ in. selvage of longitudinal edges permitted interlocking with cap and side wall flashing in the manner already indicated. The foregoing, plus stairway, pent house and

other miscellaneous sheet metal work here required 10 tons of metal.



The detail shows the various pieces used in the parapet. This design insures complete encasement of the wall and should keep all water out of the brick work. Note special cleating batten and freedom between cap and side wall sheets. The bottom, turned edge and the double seam stiffen the cap.

## CAN YOU AFFORD TO PASS UP \$22<sup>50</sup> AN HOUR "EXTRA" PROFIT ?



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Sixteen hours of labor in making Pittsburgh Locks by hand methods at \$1.50 per hour equals \$24.00. One man and a Lockformer can equal this production in one hour—at a total labor cost of \$1.50.

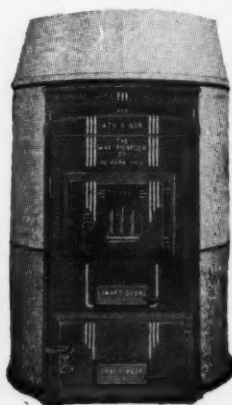
Lockformers 18, 20, 22 and 24—Easy Edgers—Power Flangers—Auxiliary Rolls—other sheet metal working equipment. Lockformer prices from \$144.00 up.

In either case, the finished material sells for the same price — represents but one hour's Lockformer production. Yet the difference in cost is \$22.50. With a Lockformer, this difference is added profit. Without one, it's merely labor costs!

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**THE LOCKFORMER CO.**

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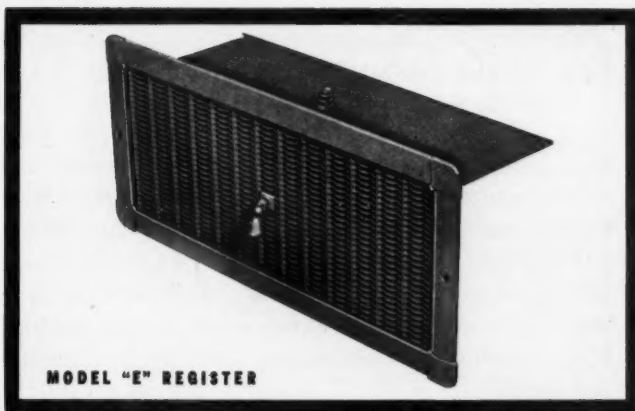
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### Over Fifty Years of Quality Heating

The key to business success is, in a large number of cases, customer recommendation. You'll find that a good furnace job that performs season after season with little or no attention, and giving top performance all the way will be one of your best assets.

You can be sure of modern, efficient heating on all those jobs if you install the time-tested ATH-A-NOR. Here's a furnace that will perform on either gravity or air conditioning jobs with equal facility. Strong construction, modern appearance, efficient performance . . . they all add up to one thing, better jobs and better profits. Write today for more information.

**THE MAY-FIEBEGGER COMPANY**  
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**uni-flo**

## GRILLES AND REGISTERS...

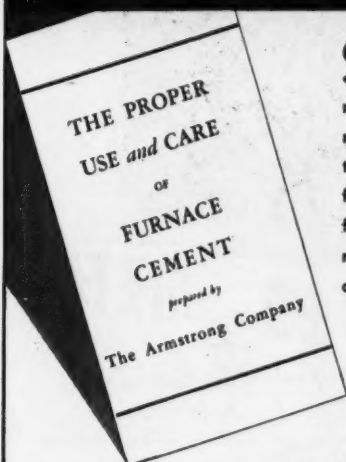
The Model "E" is a one-piece unit (integral core and frame) giving all the advantages of important UNI-FLO directed and diffused air distribution at a more economical cost. Please write for the new UNI-FLO Catalog.



Chicago DAILY NEWS Building. Architect: Holabird and Root. Air Conditioning Contractor: Kroeschell Engineering Co. Heating Contractor: Robert Gordon Co.

BARBER-COLMAN COMPANY  
ROCKFORD - ILLINOIS

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**THARCO**

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Automatic Lock  
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HEATING CONTRACTORS here is the answer to your Forced Air balancing problem. A complete locking type damper ready for installation in the stackhead. It provides a rapid, positive locking and tamper-proof control of air delivery with the register installed.

One man, alone, balances the entire system in one-third of the time required by two men using basement pipe dampers.

Leading contractors and authorities proclaim the MAYN AIR DAMPER to be the greatest advance in damper devices ever produced at low cost.

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It's the newest, smartest line of the decade. *Automatic Packaged Heat* . . . completely wired, assembled and ready to install. A complete line — coal, oil and gas-fired — that covers your market like a blanket. With all famed Conco features, it's the big-time profits line that makes every installation legitimately yours. Sales helps galore.



GAS-FIRED AIRCONDITIONERS



GAS-FIRED GRAVITY HEATERS



OIL-FIRED AIRCONDITIONERS



AUTOMATIC COAL STOKERS



CONVERSION OIL BURNERS

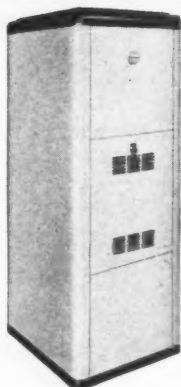


**CONCO CORPORATION**  
*Automatic Packaged Heat*  
DIVISION OF H. D. CONKEY & COMPANY  
22 AUTO AVENUE, MENDOTA, ILLINOIS

WRITE FOR FREE BOOKLET



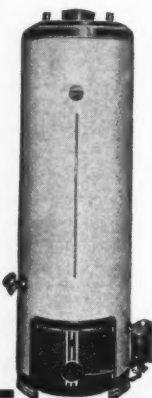
*Designed for VOLUME in the  
SMALLER CAPACITY FIELD!*



Utility room  
model, requires  
floor space only  
26" x 33".

## Complete Line of VIKING OIL BURNING FURNACES

Specially designed units—not built over or redesigned—but engineered throughout to meet heating needs of modern, small, low-cost homes requiring furnaces rated at 55,000 to 100,000 B.T.U.'s. Eight efficient, compact models—space-savers in basement or utility room—unmatched in performance and low-cost operation—and priced to sell in volume! Write for Furnace Catalog.



## Oil Burning Water Heaters

They always work—no service problem! Quality built and low-priced—automatic models to retail as low as \$75.00 installed. Fully automatic and manual models, 25 to 40 gallons. Equipped with famous Breese Burner. Write for Water Heater folder.

**VIKING MFG. CORPORATION**  
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## DOES TODAY DEMAND A SELLING JOB, TOO?

● Yes, and then some! Doing good jobs on heating plants is not enough—hundreds of competitors can do as well—today we must do a selling job *before* we get into the basement.



● You are up against an army of high pressure men, selling conversion burners, new fuels, new plants. Can you fight back, you alone, hold your old customers, and get new ones? This will help. Ask for your free Super Plan Book, which tells in detail the one best way to sell your services. To sell your greater knowledge and wider experience with heating plants. This Plan Book does help thousands of men like you. It is free.

### USE THIS COUPON

The National Super Service Company  
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Send me the Plan Book and complete information about your free trial and the new low-priced Super.

Name .....

Street Address .....

City and State.....

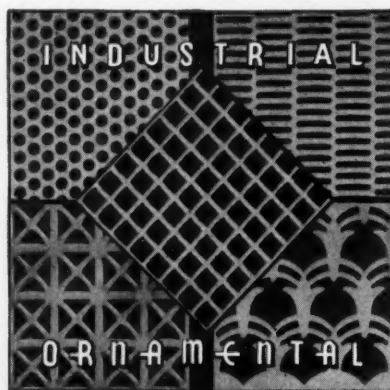
## Bookkeeping— For 1940 Requirements

(Continued from page 75)

men bluffing to cover their ignorance or shall we say in an effort to cover their ignorance. It is a rare case when bluffing can cover ignorance, particularly when the bluffer is trying to cover before one who really knows. Just why a man who has need of a bookkeeper should try to hide his ignorance of bookkeeping from his bookkeeper is beyond us.

### Don't "Kid" Your Bookkeeper

This same man would not think of trying to deceive an engineer into believing he was thoroughly conversant with engineering. He would not try to tell his physician that he, too, was a physician. But, when it comes to the bookkeeper, this same man often acts like he knows all about bookkeeping and tries to bluff it out. The bookkeeper prepares an operating statement and hands it to the boss. He looks at it a few minutes and places it on his desk for further examination, perhaps when the bookkeeper has gone home. No matter how long he looks at it, it remains just a mass of figures and, if he is the average small business man, he knows, without



## PERFORATED METAL

*Any Metal. Any Perforation*

The uses for perforated metal are numerous and increasing. Industry requires it for a thousand purposes where adaptability makes necessary perforations of many sizes and shapes.

For ornamentation it provides beauty of design in a variety of metals and finishes. Our facilities for the manufacture of perforated metal are unexcelled and we hope to serve you.

**THE  
Harrington & King  
PERFORATING CO.**

5649 Fillmore St., Chicago, Ill. New York Office, 114 Liberty St.

knowing why, that it is wrong. It is such a simple matter to say to the bookkeeper—"I would like to go over the statement and understand just what the figures are, where they come from, and what they mean."

Bookkeeping is a matter of definite determination; each figure means something and, in the end, the operating statement is a word and figure story of the things accomplished in a given period of time. Certainly if the bookkeeper can master the language and procedure of the art, the business man can do the same.

#### Bookkeeper Can "Make" Your Business

The typical bookkeeper is one of the most loyal and dependable employees of any business and can, if given half a chance, do more toward helping the boss make a success of the business than can any other member of the organization. If you have been trying to bluff your bookkeeper, we can assure you you are not getting away with it. We suggest you try a new approach. Ask the bookkeeper to read this article; then admit your ignorance of bookkeeping and give your bookkeeper an opportunity to help you master the full operation of your bookkeeping records. Once you have taken this step, you will wonder why you did not do it years ago.

### Intricate Shearing



New Standard Oil Truck with 10 gauge Steel Letters—Chrome Plated.

Here's a task to test severely any Shear. Close curves, sharp corners, inside starting, on the "STANDARD" letters demanded absolute accuracy, fine control, clean smooth edges, and skillful workmanship.

#### LIBERT Hi-Speed SHEAR

Libert Hi-Speed SHEARS offer new speed and versatility—handling metal sheets up to 10 gauge thickness, in a great variety of shapes and forms, without adjustment.

Ask your Libert Distributor for demonstration or write us for latest bulletins.

**LIBERT  
MACHINE CO.**  
GREEN BAY, WISCONSIN  
Manufacturers of Shears since 1915



**Libert Hi-Speed SHEAR**



**THEY LOVE TO  
GET UP IN THE  
MORNING WITH  
TIMED  
TEMPERATURE  
CONTROL**

A 13-hour clock fitted into this Timer Thermostat is controlled by a setting knob on an indicating dial that shows the number of hours that will elapse before the thermostat will come into control.

The complete Timer Set includes the Thermostat, new B-60-6 Valve and P.G.-6 Thermocouple Pilot Generator which supplies current to operate the Valve without any connection to outside source of energy.

This Timer Set is designed especially for domestic use in connection with gas heaters. Temperature range, 50° to



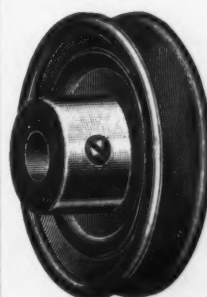
90° F. Differential, 1/2° F. Finished with dull chrome Thermostat case and unbreakable plastic back plate. Night cut-off is available. Special model for Butane. Send for new 1940 catalog.

### GENERAL CONTROLS

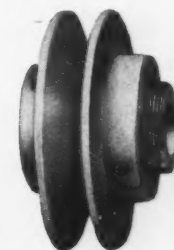
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MAUREY Variable Pitch and Steel V-Pulleys have long been leaders in the field of Fractional Horsepower Transmission. They are installed in the products of the leading manufacturers of Stokers, Blowers, Fans, Air Conditioning and Refrigeration Units.

The latest MAUREY development is the New Cast Iron V-Pulley. It is made with oval instead of the usual flat spokes, providing better weight distribution, strength and balance, for smooth, quiet, vibrationless running at high speeds. Annealed to prevent internal stresses and strains. Grooves are machined with micrometer accuracy to insure longer belt wear.

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# WHAT THEY SAY About "HOME COMFORT" HEATING



\*Mr. X says: "\$97.64 was the total cost for heating my 14 room residence located in St. Louis County (1939-40 season). The 'Home Comfort' Automatic Oil Burning Furnace, operating fifteen to twenty minutes per hour maintained 72° temperature during the extreme weather when outside temperatures ranged from 10° to 15° below zero."

\*Name and address will be furnished upon request.

## Gas Furnaces — Stokers — Oil Furnaces

Designed and engineered to give maximum heat and eliminate fuel waste.

Home Comfort's complete line of air conditioning and gravity furnaces, with its large selection of sizes, affords an opportunity to you, Mr. Dealer, to make many satisfied customers like the one above.

A line of quality furnaces with low prices. Write us today for complete information. We offer exclusive territory protection.

## HOME COMFORT HEATING UNITS

ST. LOUIS FURNACE MFG. CO., 2901 Elliot Ave., ST. LOUIS, MO.

## NEW AIR CONDITIONING REGISTERS

The New Rock Island line of Air Conditioning Registers now shown in complete new catalogue just off the press.



No. 822 Wall Register—Horizontal Vanes

The New Rock Island Air-Vane Registers are of bar type fabricated construction—Attractive Appearance—Rigid Construction—Vertical or Horizontal Vanes—Simple, secure adjustment.

New Catalogue and Dealers Net Estimating Book, a time and money saver, gives full particulars, prices, etc.

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ROCK ISLAND REGISTER CO.

Rock Island, Ill.

Mail me a copy of your new catalogue and dealer's net estimating book.

Name .....

Street Address .....

City & State .....

## Kruckman's Washington Letter


(Continued from page 34)

The REA offers those who wish to advertise and demonstrate their wares, both locally or nationally, an unusual vehicle. For over a year it has maintained a travelling show which operates exactly like a circus. The troupe, consisting of employees of the REA and the merchandisers who furnish the goods used after an area is electrified, travel in a caravan of automobiles. They have visited Michigan, Ohio, Indiana, Illinois, Wisconsin, Kansas, New Mexico, Texas, Oklahoma, Louisiana, Georgia, North Carolina, and Maryland.

### Show's Itinerary

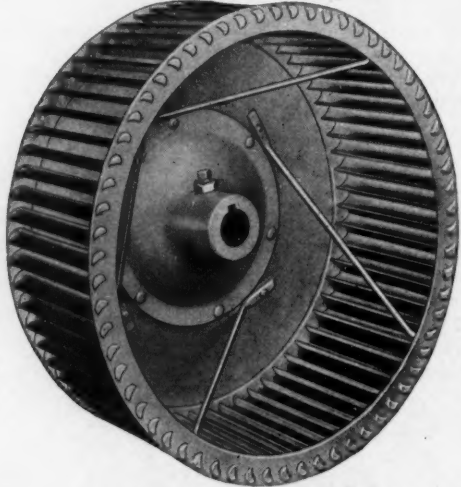
During the next six or eight months the show will go into Virginia, Delaware, Pennsylvania, Missouri, Arkansas, and back to Illinois, Michigan, Wisconsin, Minnesota and Texas. The show makes two towns each week and stops an average of two days at a town. It has an advance agent exactly like a circus, and the agent not only bills the country-side and plants his publicity in the local newspapers, but he arranges with local merchants to participate by advertising their wares and their services.

The show is held in a big tent surrounded by a brood of smaller tents. There is regularly scheduled entertainment with music and drama and all the trimmings. Local talent is encouraged to take part. Many different kinds of equipment, electrically operated, are conspicuous parts of the exhibition in the different tents. Everything that is shown is demonstrated by competent men and women sent from the factories or from the agencies of the Government in Washington. Many farmers were found to be eagerly interested in electrically operated heating plants and in air-conditioning systems. The farmers come to the show from miles around from remote communities



## Janette Blower Wheels

**WHEELS for EVERY APPLICATION**  
Oil Burners—Gas Burners—Blowers—Coal Stokers  
Air Conditioning Apparatus



**A COMPLETE RANGE OF SIZES  
5" x 1" TO 12" x 12" TO MEET  
YOUR INDIVIDUAL REQUIREMENTS**

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**Janette Manufacturing Company**  
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in adjacent counties and areas. The coming of the show is an occasion. During the Christmas holidays the show was completely renovated and enlarged, and the Government, as well as the commercial units, added personnel and automobiles and trucks. If you wish to make use of the show to exhibit your wares we will gladly send you the itinerary. Send a self-addressed stamped envelope.

## Interior Exhaust

(Continued from page 52)

closing windows all the time to get the flow of air to points where it was needed when the owner changed his seat. With this system all windows are generally open, and the only change at any time—if any, is to close the bedroom doors into the hallway."

## National Warm Air Convention

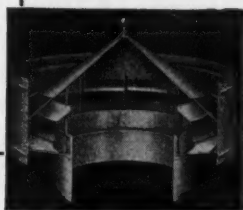
(Continued from page 81)

can be suppressed and explained the decibel chart which is the base evaluation for all noise. Slower running mechanical equipment, vibration pads of accepted types, flexible connections between equipment and duct work, lower air velocities through systems, linings of ducts and housings, were suggested by Prof. Watson as the simplest means of suppressing ventilating system noises.

# BURT

Standard Gravity

## VENTILATORS



### MAKE MORE MONEY FOR YOU

Burt can supply ventilators to meet any specification on any job—private or public—at prices that give big values and pay you a good profit. Burt makes a size and a type for every purpose, of any kind of material. Burt engineers are glad to be of assistance in estimating and laying out plans.

Send for Catalog

## THE BURT MFG. CO.

Roof Ventilators, Oil Filters, Exhaust Heads

301 MAIN ST., AKRON, OHIO

## FOR MORE QUIET, EFFICIENT PILLOW BLOCK PERFORMANCE



*Randall*

For service in the field day after day, month after month without complaint or failure under trying conditions, be sure your equipment is fitted with Randall Pillow Blocks.

**RANDALL GRAPHITE PRODUCTS CORP.**  
DEPT. 611, 609 W. LAKE ST., CHICAGO, ILL.

Send now for No. 40 catalog showing complete Randall line.

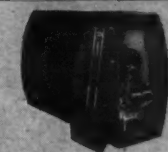
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**LEADING MERCHANT**  
IN YOUR TERRITORY WITH

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HOME COMFORT-PROVIDING EQUIPMENT

### SUSTAINED LEADERSHIP

Gar Wood automatic home heating and air conditioning furnace-burner units led the nation in percentage of total sales in 42 key markets for the last four consecutive years—according to statistics published by a national trade authority. Cash in on Gar Wood's sales popularity. Become a prosperous leader in your community. Write or wire for the Gar Wood franchise facts.



Tempered-Aire Units



Conversion Oil Burners



Boiler-Burner Units

### PRODUCTS

Oil- or gas-fired automatic Tempered-Aire Winter Air Conditioning and Heating Units—Split Systems—Boiler-Burner Units—Conversion Oil Burners for existing Boilers or Furnaces—Domestic and Commercial Water Heaters—Ventilators—Airdux System for air distribution and control. Ask or write for descriptive literature.

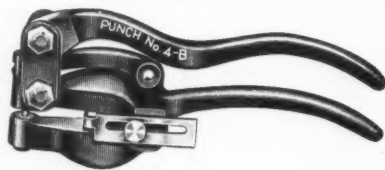
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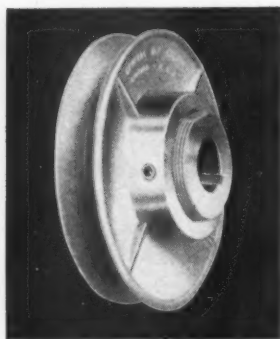
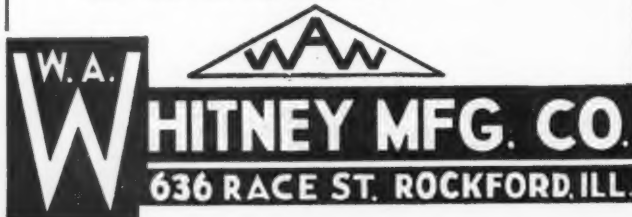


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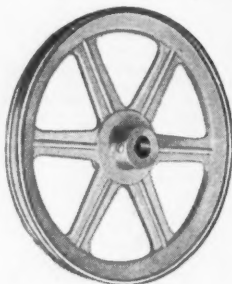


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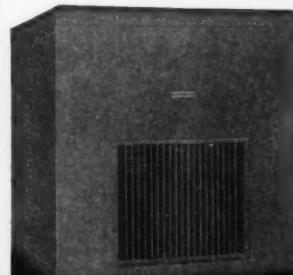
## Prof. Kratz Explodes Some Bombshells

Prof. A. P. Kratz, University of Illinois, speaking on "Fundamentals of Heating and Ventilating" reviewed some of the present day findings on the effects of air conditioning on health and comfort. "We all know," said Prof. Kratz, "Air conditioning is conducive to comfort; also we know that comfort seems to be conducive to health; therefore, air conditioning should be conducive to health. We believe, today, that the body is a heat generating engine and that bodily heat loss is controlled by temperature and air insulation. We are beginning to understand how structural construction, as well as air temperature, air velocity etc., affect bodily heat dissipation.

"For example, we understand now that insulation in walls and surfaces to which the body is exposed tend to increase the surface temperatures and therefore reduce the rate of temperature dissipation from the body to cold wall surfaces. Insulation, therefore, not only saves fuel, but also establishes a better comfort condition within the space. We also understand today that insulation, correctly applied, will reduce floor-ceiling temperature differentials, and we are beginning to understand why many home owners insist comfort conditions are not obtained when the thermostat at breathing level shows 72 deg. Floor-ceiling temperature differences account for this discomfort despite the showing of the breathing level thermostat.

Prof. Kratz very interestingly took apart the old specification of 30 cu. ft. of air per minute per individual for adequate ventilation and explained how this very old theory was established on the limitation of 8 parts of CO<sub>2</sub> in 10,000 parts of air. Investigations in submarine air have shown, said Prof. Kratz, that 250

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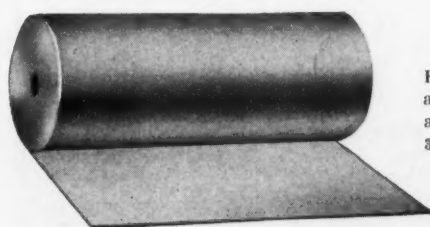
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parts of CO<sub>2</sub> in 10,000 parts of air are not detrimental to health and we have recently found that 2 cu. ft. of air per minute per person will result in not more than 44 parts of CO<sub>2</sub> per 10,000 parts of air, so this particular theory seems passe.

We are coming to believe, said Prof. Kratz, that the problem of dissipation of bodily odors is much more important than the CO<sub>2</sub> content of the air. Investigation by Prof. Yaglou, Harvard School of Public Health indicates that a complete new set of standards must be established if we accept the bodily odor theory of adequate ventilation. Prof. Kratz then showed these Yaglou standards for odor dissipation which indicate, in brief, that 30 cfm are insufficient for some conditions and are more sufficient for other conditions, but the conditions must be established by occupancy and not by a blanket regulation of 30 cfm per person.

Prof. Kratz also raised the question of whether a high relative humidity is as conducive to comfort and health as we assume. From data we have established showing how much relative humidity can be maintained in the average residence with the equipment available today and under the condensation point, we are seemingly arriving at the conclusion that 25 per cent to 30 per cent relative humidity is all that should be asked for in a winter air conditioning system. Prof. Kratz pointed out that many persons experience a feeling of dryness when the relative humidity falls below 20 per cent, but above 20 per cent these same persons usually cannot detect fairly wide changes in relative humidity content. Beyond 25 per cent R.H. we do not now have data establishing increasing comfort and health.



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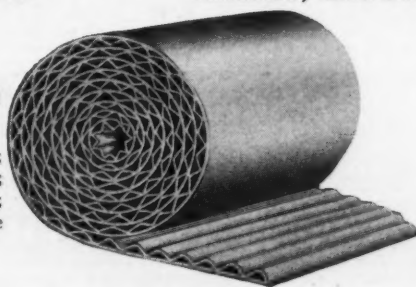
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### Effects of Insulation in Residence

Prof. S. Konzo, University of Illinois, outlined some of the investigations now under way and briefly summarized the results to date. The Research Residence has been insulated in the third floor ceiling and in all side walls and tests are under way to establish the effect of insulation on residential heating systems.

Through insulation the third story heat loss has been reduced 60 per cent, the second story heat loss 40 per cent, and the first floor heat loss 25 per cent. In order to maintain uniform temperatures on the three floors it was necessary to rebalance the mechanical warm air heating plant.

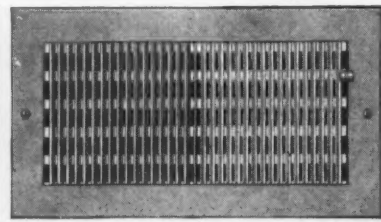
The research residence heating system is at present stoker-fired and tests with the insulated residence indicate a reduction in fuel consumption of approximately 30 per cent. Prof. Konzo pointed out that the same reduction probably would not be obtained with oil and gas firing due to the intermittent firing of gas and oil furnaces. Flue gas temperatures in the stoker-fired research system have been reduced approximately 100 deg. after insulation, but Prof. Konzo pointed out that this does not result in a comparable increase in operating efficiency as, ordinarily, the operating efficiency falls off due to the much longer periods when the system is not operating.

### Results with 3 Air Changes Per Hour

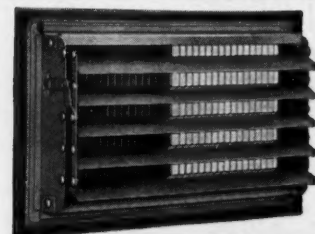
A very interesting series of investigations is under way in the insulated house covering the overall effects from a reduction in the number of air changes per hour. The insulated residence has been tested down to three air changes per hour with baseboard registers and the overall results seemingly are just as good as with 5, 6, 7 or more air changes per hour as recommended in the technical code. At only three air changes per hour, fan operation automatically increases in running time, thereby reducing the number and extent of off-fan periods. At 1675 cfm, the floor-ceiling temperature differential was 2 deg.; at 800 cfm (3 air changes per hour) the floor-ceiling temperature difference was still only 3 deg., indicating that the number of air changes seemingly has not affected the floor-ceiling temperature differential as anticipated. The overall house air changes per hour, including the off-cycles of the fan, for three air changes per hour and 5 to 7 air changes per hour, indicate that the total running time of the fan is just about the same with three air changes as with 5 to 7 air changes. At reduced air delivery, the fan runs for longer periods while at increased air changes per hour, the fan runs on shorter and more frequent cycles.

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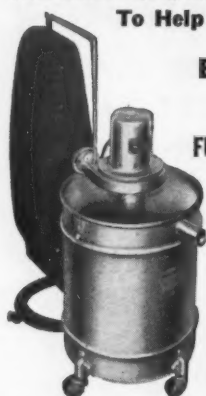
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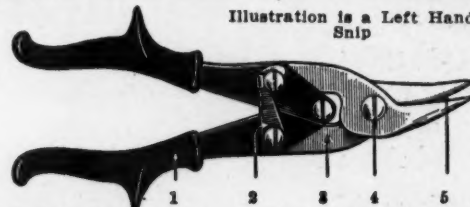


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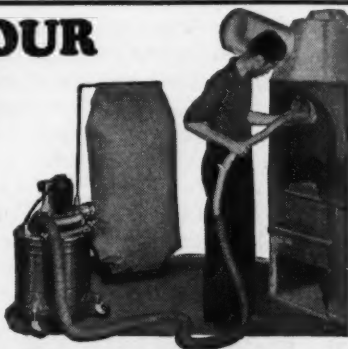
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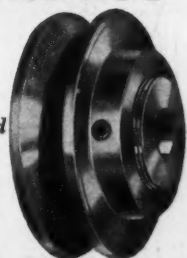
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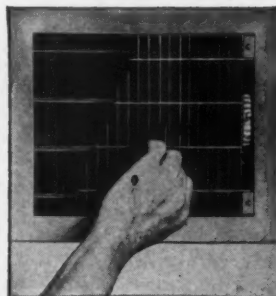
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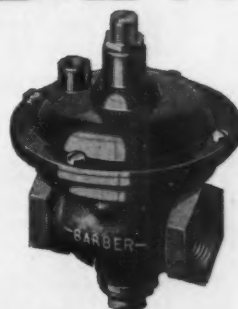
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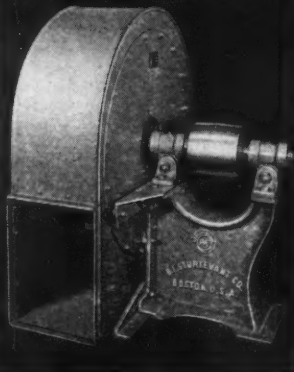


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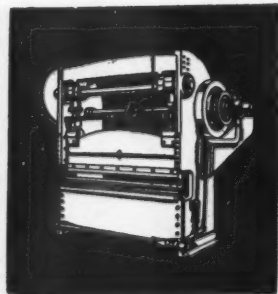
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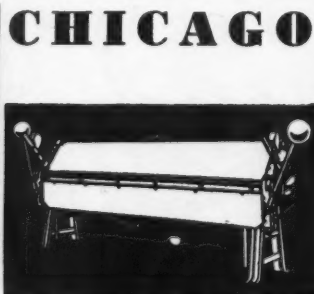
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In connection with those tests, Prof. Konzo pointed out that contractors very frequently increase bonnet temperature settings when any one room does not come up to temperature or when too cold rooms are experienced, whereas investigations indicate that *reducing* the bonnet temperature setting, thus *increasing* the fan operating time, gives better results.

For entertainment, members and guests were invited to the Chez Paree on Tuesday evening for a dinner and entertainment the same as last June. The attendance at the golf meet was the largest ever, with 90 players and 30 non-golfers. Over 100 people sat down for dinner at which Chairman Ebbert introduced the General Chairman, Reid Mackin and his two Co-Chairmen, Harvey Manny and Ralph Blanchard. The prizes were then announced and given out.

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## Attic Fans For Commercial Establishments

(Continued from page 39)

moving approximately 7,500 cfm, were then installed in the building at the 9-foot level. Lastly, 12 fans were installed along the side walls of the building to bring in the outside air. The building has a ceiling height of 45 feet so it was necessary to move all the air under the roof completely to avoid any stratified hot air blanket within the building.

How well ventilation served the occupants is indicated by reports from the vegetable concessioner who declared he had a 20 per cent decrease in spoilage. The meat stand reported a saving in refrigeration. The bakery department reported much less annoyance from flies than formerly.

## Neubecker Pattern

(Continued from page 56)

can be fabricated by using regular elbows as shown in Fig. 45. Here we have a front and side view of a double curved offset by simply using two elbows, one cheek having the wide side of the duct as at A and the other cheek the narrow side of the duct as at B, the two elbows joining at the seam line as indicated. Should elbows of the type be required, forming a transition from rectangle to square, then either the upper or lower elbow would be drafted as was described in connection with Fig. 44.



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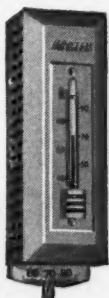
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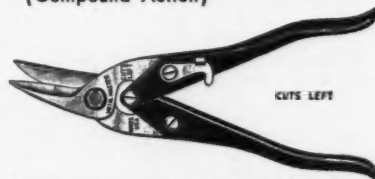
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you mingle with the men  
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# Classified

# AMERICAN ARTISAN Service Section

## SITUATIONS OPEN

**WANTED:** Sheet Metal Foreman who has had experience doing high grade Residential, School and Church work with some knowledge of forced-air heating and ventilating. Must be capable of taking complete charge of entire job. This position offers an exceptional opportunity to a man of ability. Address Key No. 492, American Artisan, 6 No. Michigan Ave., Chicago, Ill.

**WANTED ROOFING ENGINEER.** A large nationally known metal company desires young man to promote sale of Sheet Metal Roofing materials. Must have architectural experience and complete knowledge of Sheet Metal practice. Write full particulars and experience. Address: Key No. 497, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

**OPPORTUNITY.** Warm Air Furnace Manufacturer wants experienced Sales Manager; chance to share in future profits. Answer stating experience, salary expected, and references. Address Key No. 498, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

**SALESMAN WANTED—**For Iowa and Nebraska territory, by one of the largest manufacturers of coal, oil and gas-fired heating and air conditioning equipment. Give complete information and photo in first letter. Address: Key No. 499, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

**ENGINEER WANTED—**With practical knowledge of heating and air conditioning equipment, installation work, and control apparatus, by large, nationally known manufacturer of coal, oil and gas-fired heating and air conditioning equipment. Give complete information in first letter, including photo, if available. Address: Key No. 500, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

## LINES WANTED

Interested in representing the factory as exclusive agent in and adjacent to Ohio. Lines should be allied to the Heating, Air Conditioning and Ventilating industries. Able to promote sales to manufacturers, jobbers, dealers and contractors. Address: Key No. 495, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

## FOR SALE

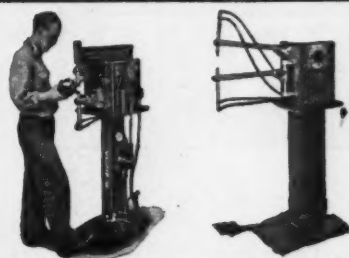
**FOR SALE** in Phoenix, Arizona, an old, state-wide, known, Sheet Metal Works, with high grade equipment. Shop room 45 x 70 ft., store room 20 x 60 ft. and nice office room 12 x 18 ft. Also well equipped. Three room apartment in connection. Rent for all only \$65.00 per month. Will sell at low figure part-time to responsible party. Owner has made his stake and wishes to retire from business. If interested write Owen Sheet Metal Works, 825 E. Washington St., Phoenix, Arizona.

**FOR SALE at Best Offer.** A Furnace and Sheet Metal Shop. Established 30 years at same place. Invoices will be sent to interested party on request. Reason for selling, account of deaths. Address: Key No. 496, American Artisan, 6 N. Michigan Ave., Chicago, Ill.

**For Rent or Sale:** Established Sheet Metal and Roofing Shop. Address Key No. 493, American Artisan, 6 No. Michigan Ave., Chicago, Ill.

**CORRUGATED STEEL SHEETS.** Surplus galvanized and black; flat or corrugated. New. All gauges and sizes. Address Ackertund, 1309 So. 55th Ct., Cicero, Ill.

**Use AMERICAN ARTISAN Classified Advertising** for quick results. It puts you in direct touch with the buyers and sellers in the warm air heating, sheet metal contracting and air conditioning industry.



Electric welding equipment of every description to weld from a watch case to a door. Special or standard SPOT WELDERS from 1/4 to 500 K.V.A. A.C. Arc Welders from 100 to 400 Amps. We invite contract Spot Welding in large or small quantities.

**EISLER ENGINEERING COMPANY**  
CHAS. EISLER, PRES.  
761 S. 15th St. (Near Avon Ave.) Newark, N. J.

## BLOWERS — FANS — EXHAUSTERS

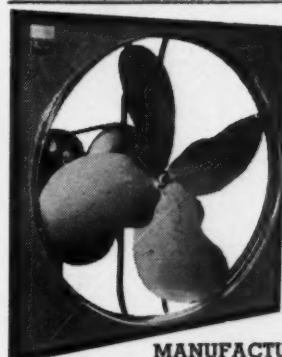
**THOROUGHLY REBUILT,** for perfect performance. All types; all standard makes. All sizes including the big ones. Hundreds in stock, meeting all requirements. Attractive prices. Fully guaranteed. Expert engineering counsel. **GENERAL BLOWER CO.,** Engineers, 403 North Peoria Street, Chicago, Illinois.



For all around work take a  
**Speedway**  
No. 185 Saw

Cuts Wood, Tile Marble, Cement, Slate and Gypsum, handles any and every job. More power (1-1/5 h.p.), more speed (4,600 r.p.m.). Full Ball Bearing construction. Guaranteed spiral-bevel gears. Ripping Guide, accurate bevel adjustment, yet weighs only 25 lbs. Grease twice a year. 5 other types all with special wound Speedway motors. Now low prices. Write for Saw Circular.

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1856 S. 52nd Ave. Cicero, Ill.



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30"  
36"  
42"  
48"  
54"  
60"

**G. E. Motors**

**ALCO**

**MANUFACTURING CO.**

2619 Milam St.

Houston, Tex.



**Save Money, Time and Muscle**

Drill Concrete with the "Do-All" Combination Electric Hammer and Drill. Set expansion bolts 10 to 20 times faster than with hand tools. Drills concrete, brick, stone, metal, wood. 3 tools in 1. Easy to maintain—Pays for itself. Bulletin No. 381.  
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Rigid steel frame—welded joints. Felt cushioned, no flutter, aluminum louvers for quick, silent operation.

Center tie-rod for uniform and simultaneous action.

Sizes up to and including 72"

"FRIGID" EXHAUST FANS

Certified ratings. Deep Back-Set Blade. With cord, plug and on-off switch. Sizes up to 48".

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**SHEET METAL PRODUCTS**  
1526 W. 25th St., Cleveland, O.



**Extra!**

Contains complete description and listings of America's largest stock of New, Used, and Rebuilt Punch Presses, Sheet Metal Machinery, Production Machinery, and Machine Tools.

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completely indexed—full specifications. Over 200 illustrations—64 pages—handsomely printed on enameled stock—durably bound for permanent reference. Describes OVER 2000 machines in stock ready for IMMEDIATE SHIPMENT!

**INTERSTATE MACHINERY CO., INC.**  
187 S. Clinton St., Chicago



## The Electric City Gutter Former

**MAKE YOUR OWN GUTTER AS YOU WANT IT**  
Easily and quickly operated. Soon pays for itself.

### REPLACEMENTS

Beading Rods, Handles, Bolts, etc., quickly furnished.

### STERLING BEADER

A simple and inexpensive machine for forming round bead.

**F. L. ROBERTSON**

56 RAND STREET BUFFALO, N. Y.

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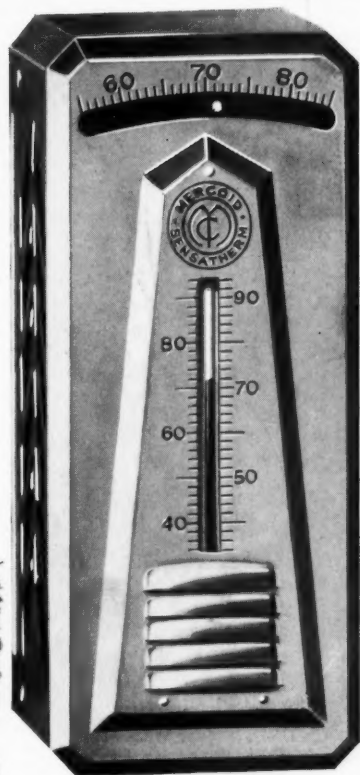
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# MERCOID TWO-STAGE SENSATHERM REPRESENTS A STEP IN ADVANCE IN THE ART OF EFFICIENT TEMPERATURE CONTROL

It is the most sensitive thermostat of this type produced and is extremely accurate and dependable in operation. It offers new and unusual possibilities in connection with oil burners, stokers, gas burners, etc. Equipped with Mercoïd magnetic type mercury switches. They are immune to contact trouble. The instrument is furnished with a sub-base which simplifies installation. Applications applying to warm air heating equipment are noted herewith. Refer to drawing No. 5 for use with Two Speed Fan Control. See drawing No. 6 for Summer-Winter control of blower. For High-Low Gas Burners, see drawing No. 4. For Prevention of Overheating on Stoker Fired Warm Air System, see drawing No. 7. Write for new catalog.

THE MERCOID CORPORATION • 4201 BELMONT AVE., CHICAGO, ILL.



WITH COVER

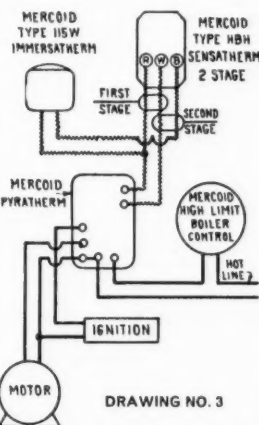


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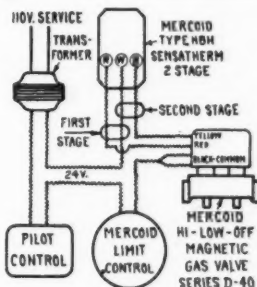
This hook-up provides a method of control which minimizes room temperature stratification.

The first stage of the Type HBH Sensatherm is directly connected to the Mercoïd PyratheRM and normally operates the burner to maintain the desired room temperature.

Room temperature stratification is minimized by maintaining a constant circulation of hot water thru the system. This is accomplished by connecting the Type 115W Immersatherm (installed in radiator or return) in series with the second stage of the Sensatherm. During periods when temperatures at the breathing line are normal (1st stage circuit open), should the water temperature get low, the Type 115W Immersatherm will close its circuit and the burner will operate to increase the water temperature so that circulation will continue. During very mild weather, should this sustained low temperature at the radiators cause the room temperature to increase 1° above normal, the second stage of the Sensatherm will open, thus preventing further operation of the burner and eliminating overheating.

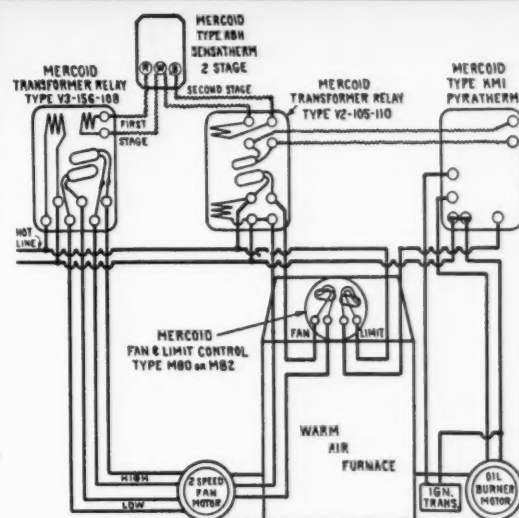


DRAWING NO. 3



DRAWING NO. 4

Above diagram covers a typical hook-up of two-stage thermostatic control of high-low fire gas burners. When room temperatures are low both circuits of the Sensatherm are closed and the gas burner operates at high fire. As the room temperature rises to the thermostat setting the 1st stage circuit opens, which causes the main port of gas valve to close. If temperature continues to rise, the 2nd stage circuit opens and the valve closes completely cutting burner down to only the pilot flame.

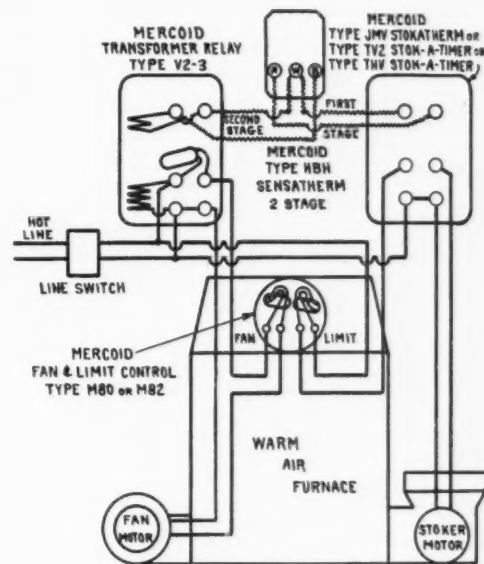


DRAWING NO. 5

In the past it has been common practice to control two speed fans on warm air systems from changes of bonnet temperature. The above diagram covers an application where the operation of the heating equipment, as well as the two speeds of the fan are regulated from the room thermostat.

This particular diagram covers an oil fired system, however, the same general hook-up is also adaptable to stoker fired or gas fired equipment. A typical hook-up is shown in the connections to the two speed fan motor. This hook-up may vary with different makes of motors, however, the relays shown may generally be employed.

When the room temperature is low, both circuits of the two stage Sensatherm are closed. This causes the burner to operate. The fan also will operate at high speed if the furnace is up to temperature (fan switch closed). As the temperature rises, the 1st stage circuit of the thermostat opens and causes the fan motor to operate at low speed. The burner will continue to operate but if excessive temperature is generated at the furnace, due to the fan operating only at low speed, the limit control will stop the burner. If the room temperature should continue to rise, the 2nd stage circuit of the thermostat will open and stop both the burner and circulating fan. On a drop in room temperature, the 2nd stage thermostat circuit closes which starts the burner and operates the fan at low speed. If the heat demand is low, the room temperature will be maintained by the fan operating at low speed, however, should the room temperature continue to drop the 1st stage circuit of the thermostat will close and operate the fan at high speed.

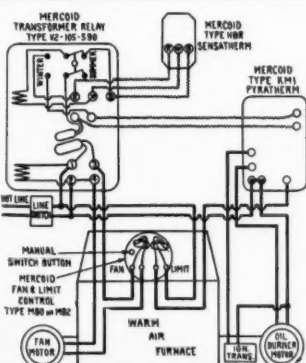


DRAWING NO. 7

Above diagram covers the application of a two stage thermostat on a stoker fired warm air system with forced circulation. The thermostat independently controls the operation of both the stoker and circulating fan. When the room temperature is low both circuits of the thermostat are closed causing both the stoker and circulating fan to operate. As the temperature rises, the high stage circuit of the thermostat stops the stoker but the fan continues to operate. If the temperature continues to rise, the second circuit of the thermostat opens and stops the fan. When the temperature begins lowering the fan alone starts operating (stoker does not operate) and if the temperature again rises the fan stops. The fan continues operating intermittently and alone, unless temperatures continue to drop when the stoker is again started.

The Fan Switch prevents operation of the fan, and circulation of cold air, whenever the furnace is not up to temperature. The Limit Switch stops the stoker, at any time temperatures at the furnace become excessive.

The Stok-A-Timer can operate, to prevent the stoker fire going out, at any time the thermostat circuit remains open.



DRAWING NO. 6

Relay Type V2-105-590 has a built-in toggle switch projecting through the cover. When thrown to the "Winter" position the heating circuit of Sensatherm HBR controls the operation of both the burner motor and circulating fan. When the room temperature is below the setting of the Sensatherm the burner will operate continuously unless the furnace bonnet reaches the temperature at which the limit control is set. When the bonnet reaches the temperature for which the fan switch is set, the fan will operate but will stop immediately when the room reaches the required temperature.

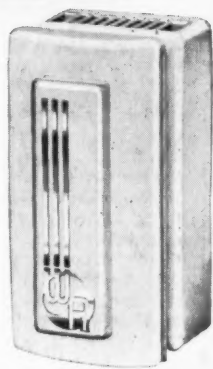
By throwing the toggle switch of the relay to the "Summer" position the low voltage circuit to the JMI PyratheRM is opened so that the burner cannot operate. At the same time the cooling circuit of the HBR Sensatherm is connected to Relay Type V2-105-590. By closing the summer switch on the fan control, the fan will operate at any time the room temperature is above the Sensatherm setting.





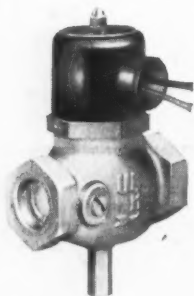
#### TYPE 519

Combination fan and limit control (or Type 523, two speed fan control). Range 100° to 300° F. Other ranges also available.



#### TYPE 120

The Thermostat with the concealed thermometer and Touch Temperature Adjustor.



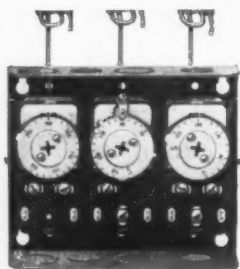
#### TYPE 1930

Solenoid Gas Valve. Available sizes 1/4" to 1". High plunger torque — no hum.



#### TYPE 726

Magnetic Relay Stoker Timer with line switch. For night set-back service.



#### TYPE 547

Combination two speed fan and limit control. Reduces wiring costs. Makes neater installation.



#### TYPE 513

Single speed fan control (or Type 408 limit control). Range 100° to 300° F. Other ranges also available.

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**HOW EASILY YOU  
CAN INSTALL**  
*White-Rodgers*

## HYDRAULIC-ACTION CONTROLS



In any position—at any angle—White-Rodgers Hydraulic-Action Fan and Limit Controls give accurate, positive performance—performance for which all Hydraulic-Action Controls are noted!

The only requirement for installations of this kind is that the Hydraulic element be placed at a suitable location in the bonnet. Once located, the flexible element may be bent to the best bonnet position with relation to air flow.

White-Rodgers Hydraulic-Action Fan and Limit Controls with visible, uniformly calibrated dials, easily-set differential adjusters, and fast-acting thermal elements which respond quickly to rapid changes in bonnet temperature, have earned their wide-spread use among heating engineers and installation men.

Investigate the advantages of Hydraulic-Action Controls today by writing for the new White-Rodgers Condensed Heating Catalog.

**WHITE-RODGERS ELECTRIC CO.**

1215 CASS AVE.



ST. LOUIS, MO.

*Controls for Heating • Refrigeration • Air-Conditioning*

